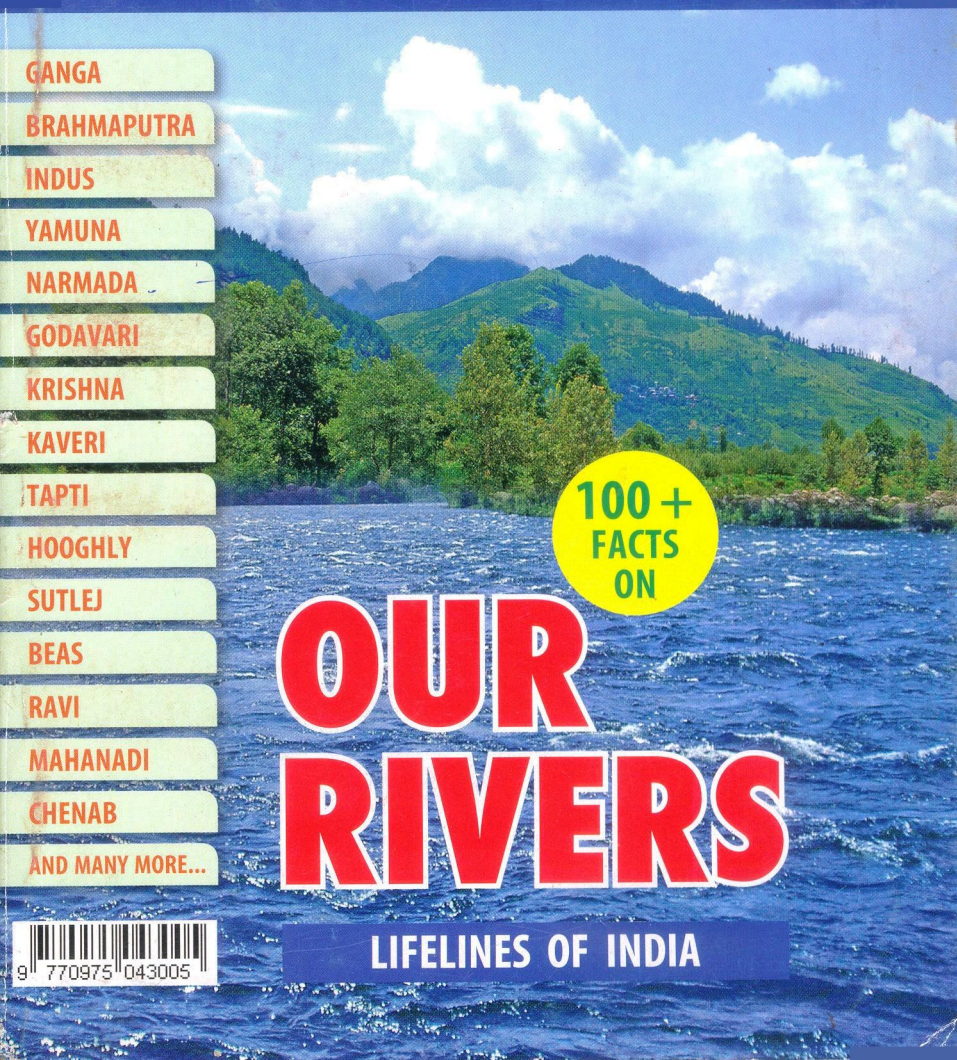
MANORAMA

TELL ME WHY

No:108



- GANGA
- BRAHMAPUTRA
- INDUS
- YAMUNA
- NARMADA
- GODAVARI
- KRISHNA
- KAVERI
- TAPTI
- HOOGHLY
- SUTLEJ
- BEAS
- RAVI
- MAHANADI
- CHENAB
- AND MANY MORE...

100 + FACTS ON

OUR RIVERS

LIFELINES OF INDIA

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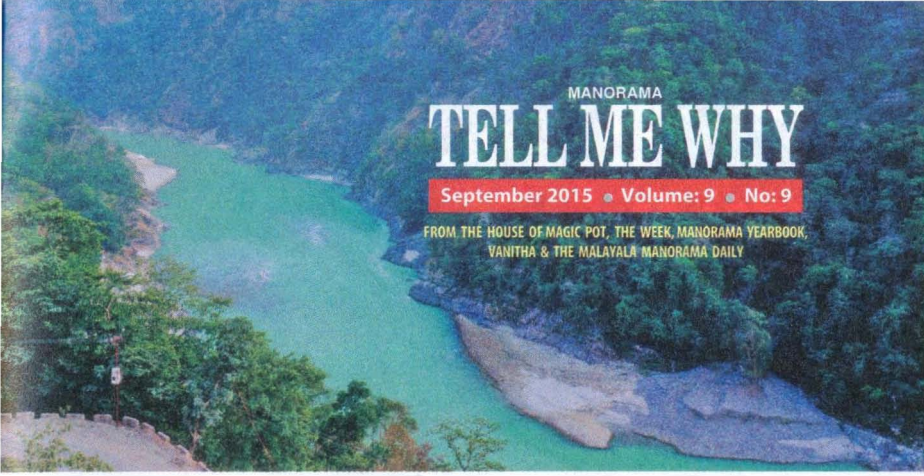

MANORAMA
TELL ME WHY
September 2015 • Volume: 9 • No: 9
FROM THE HOUSE OF MAGIC POT, THE WEEK, MANORAMA YEARBOOK, VANITHA & THE MALAYALA MANORAMA DAILY

Lifelines of India

Rivers have contributed immensely to India's great cultural identity. The very name 'India' originated from the name of one of our greatest rivers, the Sindhu (Indus) - owing to the inability of the Persians to pronouce the sound 'S'.

Rivers have always been our lifelines. Our great civilization took roots on their banks, the earliest known instance being the Indus Valley civilization that flourished centuries before the time of Christ.

On these riverbanks the ancient wisdom of sages blossomed, countless battles were fought and cultures of various colours fused. They witnessed the rise and fall of countless empires, and finally the birth of the largest democracy in the world.

This issue of Tell Me Why takes you to the world of India's great rivers.

What's Inside

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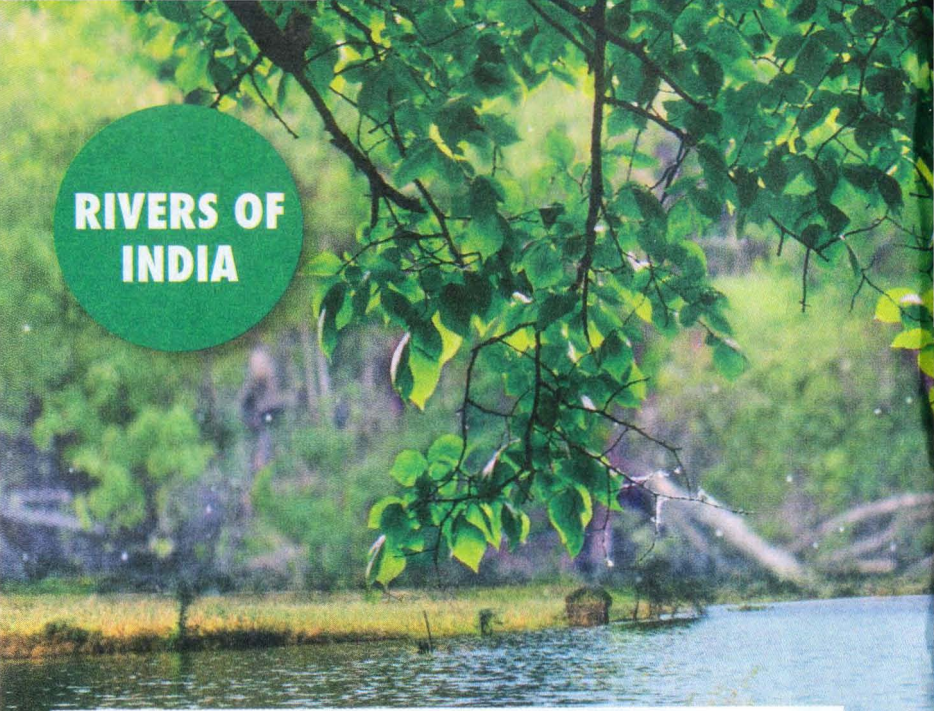


RIVERS OF INDIA

Why are rivers called the lifeline of India?

India is a land blessed by rivers, great and small. These rivers have shaped the history and culture of the land. They play an important role in the everyday lives of millions of Indians.

They provide water for drinking, cooking and cleaning, irrigation, industry and power.

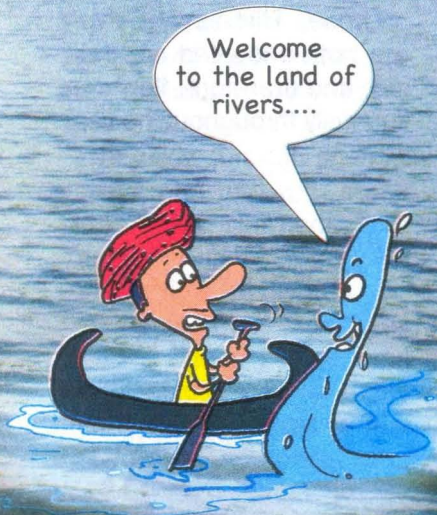
They are also a major means of transportation and communication, and provide livelihoods to millions of people too.

Cities and towns have sprung up on the banks of rivers, and many rivers are of great spiritual significance as well.

Thus it is no wonder, that rivers are considered to be the lifeline of India.

Ganga or Ganges

The river Ganga was also known as the Ganges. The British who ruled India, popularised the name. Today, the name Ganga is accepted all over the world.



Which are the major sources of water for Indian rivers?

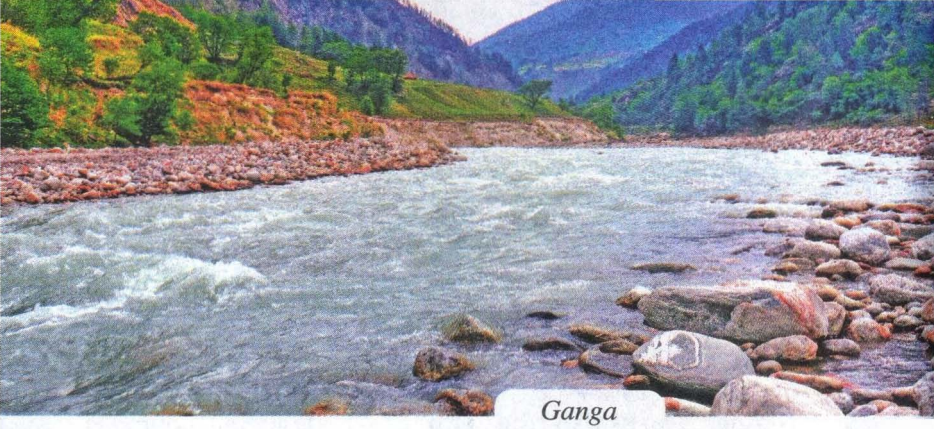
India has ten major rivers. There are three main sources from which these major rivers begin their journey.

The first main source is the Himalayan mountain range, as well as the Karakoram range. Himalayan rivers are snow-fed, and maintain a high rate of flow throughout the year.

The second main source is in Central India. It covers the Satpura and Vindhya Range and the Chota Nagpur plateau.

The third main source of Indian rivers lies in the west- the Western Ghats.

Of all the major rivers, the Narmada and the Tapti Rivers are the only major rivers that flow into the Arabian Sea. All the other main rivers empty into the Bay of Bengal.



Ganga

Which are the major Himalayan Rivers?

The snow-clad Himalayas are the source of many of the rivers of India. They are called the Himalayan rivers. The three main Himalayan rivers are the Indus, the Ganga and the Brahmaputra.

The River Ganga starts from a glacier called Gangotri Glacier, which is in Uttarakhand. At its birthplace, it is known as the Bhagirathi.

The Brahmaputra also originates from a glacier- Angsi glacier in Tibet.

The Indus originates from the Tibetan plateau near Lake Manasarovar, and enters India in Ladakh. It cuts through the Himalayas in a deep gorge near Nanga Parbat to enter Pakistan.

The Indus has five main tributaries- the Sutlej, the Beas, the Ravi, the Chenab and the Jhelum.

These Himalayan rivers are both snow-fed and rain-fed, and therefore, flow continuously throughout the year.

Which are the peninsular rivers?

The rivers that have their source in the peninsular region of India- in the Vindhya and Satpura ranges, the Chota Nagpur plateau and the Western Ghats- are known as the peninsular rivers.

The main peninsular river systems are the Narmada, Tapti, Godavari, Krishna, Kaveri, and Mahanadi river systems.

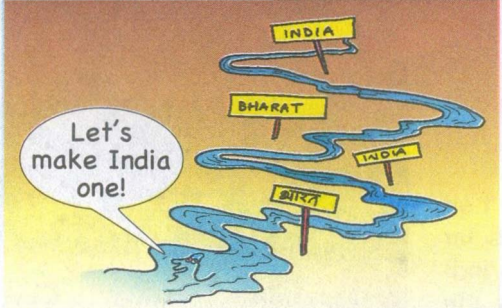
The monsoons play an important part in maintaining the flow of these rivers, so they are said to be seasonal.

They flow through shallow valleys and rifts with steep sides. The Narmada and Tapti flow eastwards, while the rest flow westwards.

They are not as winding as the Himalayan Rivers, and many of them have dams that are an important source of hydroelectric power.

The Peninsular Rivers covers a significant portion of rural India.

Narmada

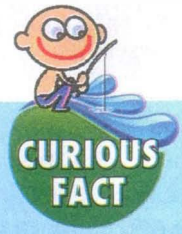


Which are the main river systems in the whole of India?

India has many river systems. The ten main ones are the Ganga, the Indus, the Brahmaputra, the Yamuna, the Narmada, the Tapti, the Godavari, the Krishna, the Kaveri and the Mahanadi.

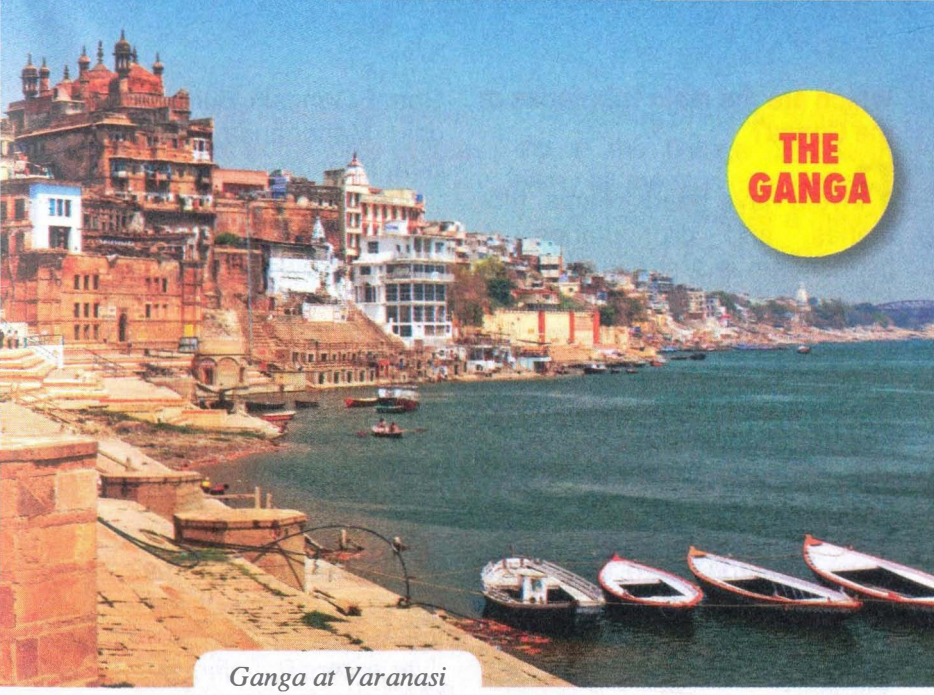
Some of these rivers flow east, some flow westwards. Some empty into the Bay of Bengal, others into the Arabian Sea.

Some flow steadily throughout the year, others are seasonal. But they all nourish the land, making life more comfortable.



Seeking Salvation

Hindus believe that the Ganga is sacred, and that bathing in it washes away one's sins. Yet sadly, the Ganga is also one of the most polluted rivers in the world. As a result, many species of fish, including the Ganges river dolphin, are endangered.



THE GANGA

Ganga at Varanasi

Why is the Ganga called a river without boundaries?

The mighty Ganga is not confined to one country. Its valleys stretch across India and Bangladesh. In fact, its basin covers parts of China and Nepal too.

Born in the lofty peaks of the Himalayas, in the Gangotri glacier, it begins its journey as the Bhagirathi.

The Bhagirathi rushes down to meet the Mandakini, and then the Alaknanda at Dev Prayag. From then on, the river is known as the Ganga.

After cutting through the Himalayas, the Ganga breaks out of the foothills at Haridwar, and flows across the vast Gangetic Plain. Midway in its course, near Allahabad, it is joined by one of its chief tributaries, the Yamuna River.

The Ganga is one of the world's greatest rivers. Its 2525 km long journey finally ends at the Bay of Bengal.

Which are the main tributaries of the Ganga?

Rivers have headstreams, tributaries, and distributaries. A headstream is a stream that is a source of a river.

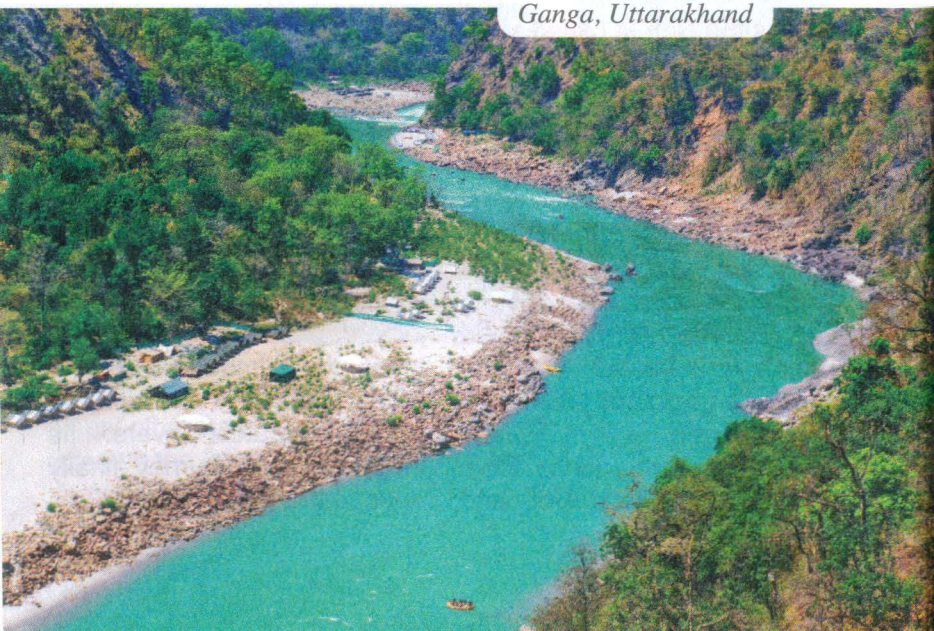
The Ganga's headstreams are the Alaknanda, Dhauliganga, Nandakini, Pindar, Mandakini, and Bhagirathi rivers.

A tributary is a freshwater stream that joins a larger river. Most large rivers are formed from many tributaries, and the Ganga has more than a dozen.

Among them are the Ghagara, Yamuna, Koshi, Ramganga, Gomti, Gandaki, Burhi Gandak, Mahananda, Tamsa, Son, Punpun.

The Ghaghara is the largest tributary river of the Ganga followed by Yamuna and Koshi. Though the Yamuna is a separate river system in itself, it is a tributary of the Ganga.

A distributary is a branch of the river that flows away from it. The Hooghly is a distributary of the Ganga that provides water for irrigation for West Bengal. It leaves the Ganga just before the river enters Bangladesh.



Ganga, Uttarakhand

Why is the Ganga an important player in the lives of Indians?

The Ganga, the national river of India, is one of the longest rivers of the world, and the longest river in India.

Born in the Himalayas, it flows towards the Bay of Bengal.

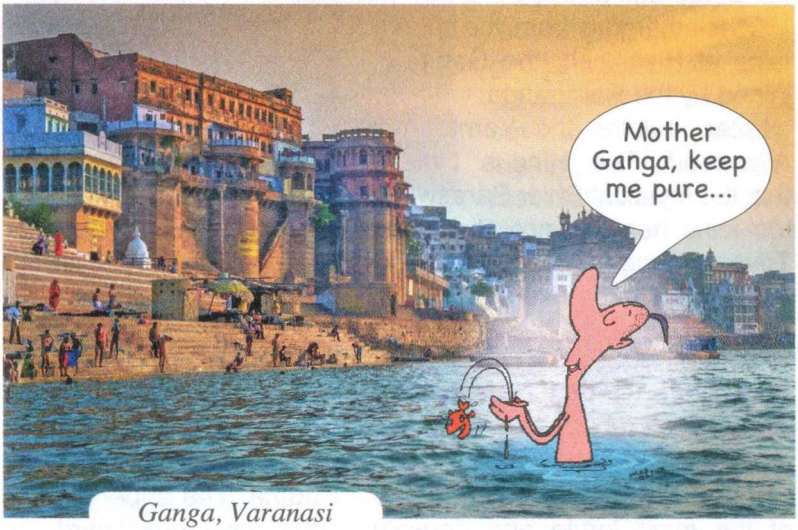
The history of the River Ganga is as old as Indian civilization. It has seen the rise and fall of many empires, and is considered sacred by the Hindus.

According to Hindu beliefs, a dip in the Ganga can wash away all the sins of a lifetime.

The river provides a means of livelihood for millions, and the fertile soil of its plains yield bountiful harvests.

Some of the crops that can be cultivated along the river include rice, sesame, sugar cane, millets, wheat, potatoes, jute, and seeds.

Thus it is not surprising that the river is often referred to as Ganga Ma- or Mother Ganga- for it nurtures the land and its people, as a mother does.



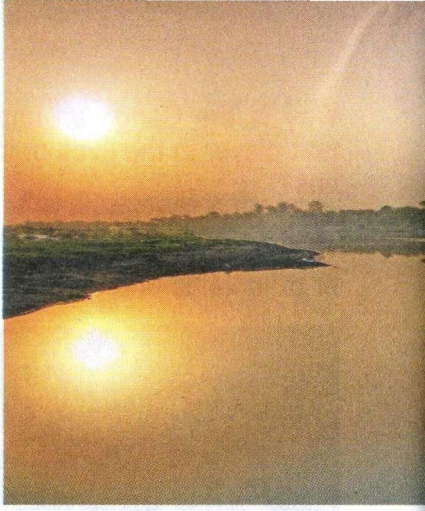
Ganga, Varanasi

Which are the rivers that join the Ganga?

The River Ganga actually begins at the Dev Prayag, the meeting place of two of its headstreams- the Bhagirathi and Alaknanda.

After emerging from the mountains at Rishikesh, the Ganga is joined by the Ramganga.

Later, it joins the Yamuna at Allahabad. The Hindus believe that the mystical River Saraswathi too joins here. Hence the name Triveni Sangam, means the meeting place of three rivers.



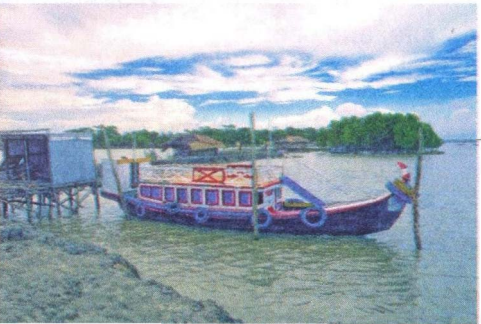
Taj Mahal on the banks of River Yamuna

Why is the Ganga important to Bangladesh too?

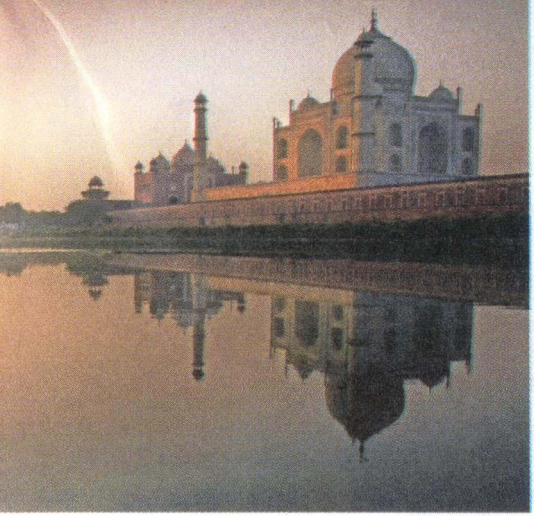
The Ganga's river basin is one of the most fertile and densely populated in the world. It covers an area of 1,000,000 sq.km.

For almost 150 km, the Ganga forms the boundary between India and Bangladesh. When it enters Bangladesh, it is known as the Padma. The upper Padma flows southeastward to receive the mighty Brahmaputra River.

The Brahmaputra is known as the Jamuna River in Bangladesh. The Padma later joins the Meghna River, before it empties into the Bay of Bengal.



Padma River in Bangladesh



Next, the Ganga flows east to meet the River Tamsa, and later on, the River Gomti joins it. The next river to join the Ganga is the Ghagara. Further downstream, the River Son joins the Ganga from the south, and the River Koshi from the north.

By the time the Ganga reaches the Bay of Bengal, its waters have mingled with those of several other rivers, making it mystically representative of the soul of India itself.

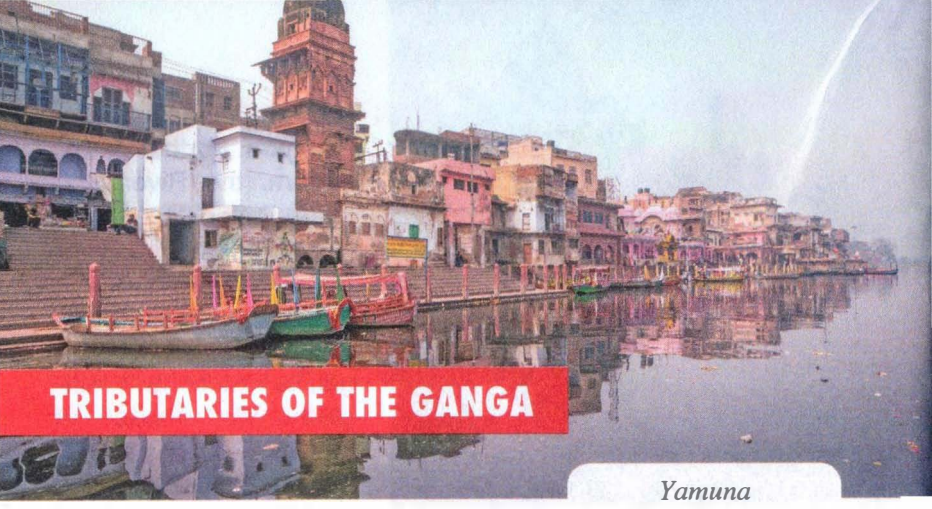
The Padma River is known for the frequent erosion of its banks, shifting channels, and sandbars that continually emerge in its course.

The river is a busy waterway, and fishing is an important industry along its banks.

A number of fast developing urban centres have also come up along its banks.

Largest Delta

The Ganges delta is the world's largest river delta. It is formed by the silt laden waters of the Rivers Ganga and Brahmaputra as they empty into the Bay of Bengal.



TRIBUTARIES OF THE GANGA

Yamuna

Why is the Yamuna both a tributary and a river system?

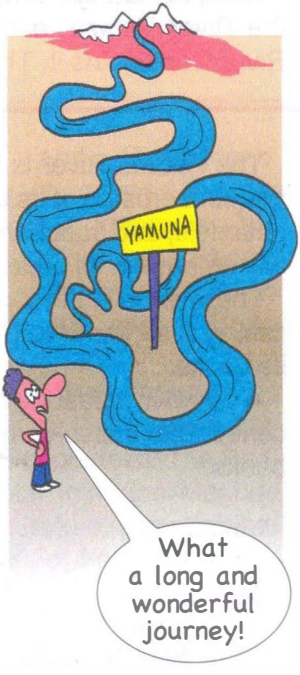
The River Yamuna is the most famous and greatest tributary of the Ganga.

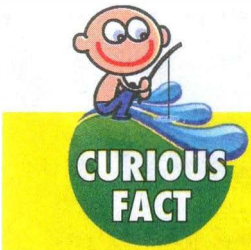
One of the country's most sacred rivers, its birthplace is the Yamunotri Glacier, high up in the Himalayas in Uttarakhand.

It flows through the foothills of the Himalayas into the Indo-Gangetic plain, flowing through Uttar Pradesh, Himachal Pradesh, Haryana, Rajasthan, Madhya Pradesh and Delhi.

After 1376 km, the Yamuna meets the Ganga at Allahabad. Their confluence, is well known.

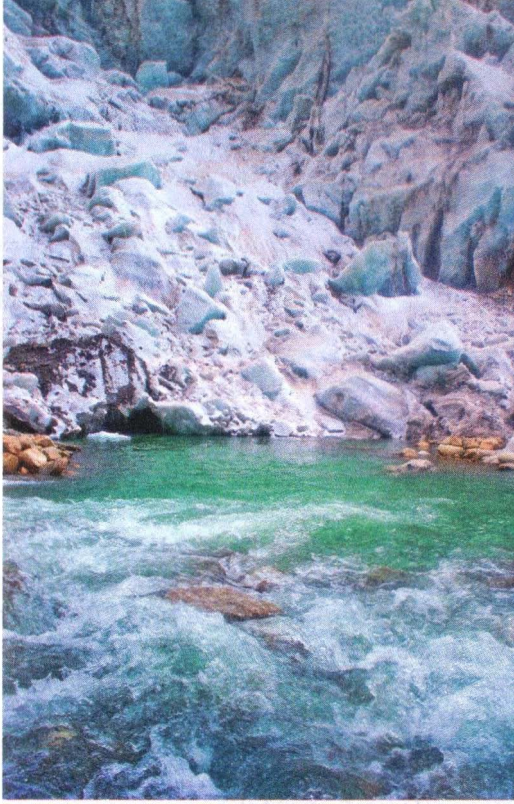
The important tributaries of the Yamuna River are Tons, Chambal, Hindon, Betwa and Ken. Other small tributaries of the Yamuna River include





All are One!

The Chinese call it K'ung-ch'iao Ho. The Nepalese call it Kauriala and Karnali. In India, it is also known as the Gogra and Ghaghra. But all these names refer to one river- the Ghaghara.



The Source of the Ganga

the Giri, Sind, Uttangan, Sengar and the Rind.

Thus, though the Yamuna is a tributary of the Ganga, it has many tributaries of its own as well. Therefore, the Yamuna is considered to be a river system in itself.

Why is the Ghaghara considered to be an important tributary of the Ganga?

The Ghaghara is the largest tributary of the Ganga. It is a river that crosses many countries in its journey.

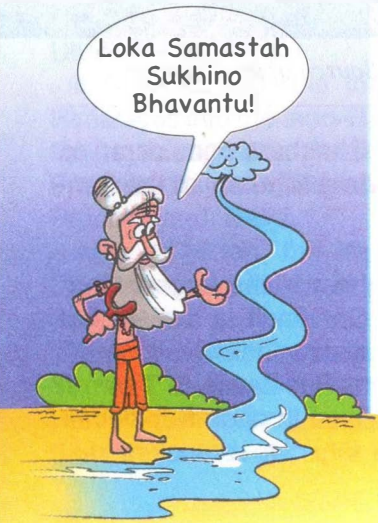
Born in the Himalayas in Tibet, it flows South east through Nepal. Later, it splits into two branches that

Ganga

rejoin south of the Indian border.

The Ghaghara flows through Uttar Pradesh and Bihar, and then joins the Ganga. Its major tributaries – the Kuwana, the Rapti, and the Little Gandak rivers – all flow into the Ghaghara from the mountains to the north.

The river's flow is influenced both by glacial melt and the monsoon. Together with the Ganges and its tributaries, the Ghaghara has helped to form the vast, fertile, alluvial plain of northern Uttar Pradesh.



What is the significance of the River Gomti?

The River Gomti, a tributary of the Ganga, has great mythological significance.

Most Hindus believe that a ritual dip in its waters will purify a person from all sins. According to legend, the river is the daughter of Sage Vasishta, who brought the river from heaven to Earth.

The river is also associated with the epic Ramayana. Lord Rama is believed to have taken a

dip in the river on the advice of Sage Vashista.

Lakshmana, the younger brother of Lord Rama, is believed to have stayed at Lakshman Teela - part of present day Lucknow- on the banks of River Gomti.

Some even trace the name of Lucknow city to Lakshmana. The Gomti rises in northern Uttar Pradesh, and flows through the state, draining an area of 18,750 sq. km. It is joined by one of its own tributaries before flowing into the Ganga.

Why is the River Gandak important to both India and Nepal?

The River Gandak is formed by the union of two rivers that have their source in the Himalayas in Nepal.

These rivers are the Kali and the Trisuli, and once they merge, the river is known as the Narayani in Nepal.

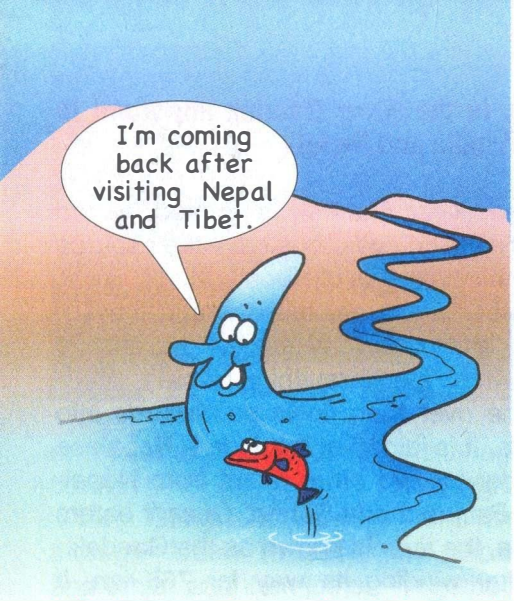
The river then flows southwards into India. It is joined at the Indo – Nepalese border by two other rivers from Nepal- the Pachnad and Sonha. Once it enters India, the river is known as the Gandak.

After winding its way for 765 km, it merges with the Ganga opposite Patna. The Gandak is one of the major rivers in Nepal and India.

It is distinguished for the deep gorge across which it flows, and for a large hydroelectric facility in Nepal.

This river also provides water for a major irrigation and hydroelectric power facility at the Indo-Nepal border at Valmikinagar.

Ganga, Near Patna



What do we know about the Koshi River?

The Koshi River- also called the Kosi- is an important tributary of the Ganga.

It flows through Tibet and Nepal, before entering India from the Himalayas. The river is joined by major tributaries, approximately 48 km north of the Indo-Nepal border, breaking into more than 12 distinct channels.

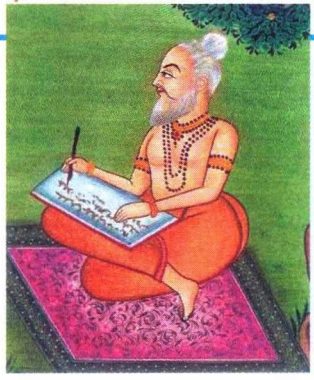
These channels shift during flooding and so, the river shifts course frequently.

The river basin is surrounded by the ridges separating it from the Brahmaputra in the north, the Gandaki in the west, the Mahananda in

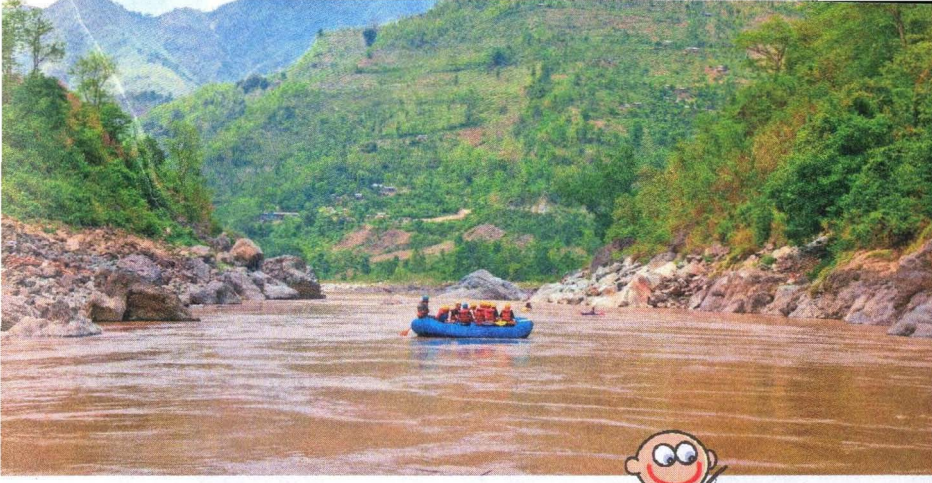
What is special about the River Tamsa?

The Tamsa River flows through Madhya Pradesh and Uttar Pradesh. A tributary of the Ganga, its origin is at Tamakund in the Kaimur Range.

The Tamsa is 264 km long. It is famous for the many waterfalls through which it tumbles during its journey to meet the Ganga.



Valmiki



River Koshi

the east, and by the Ganga in the south.

The river, along with its tributaries, drains a total area of 69,300 sq.km up to its confluence with the Ganga in India.

The river has great significance for Hindus for they believe that Lord Rama spent his first night during the 14 years of forest exile on the banks of the Tamsa.

There is also a belief that the rare and elusive Fwindoju Fish lives in this river. The ashrams of the sages Valmiki and Bharadwaj are also believed to have been located on the banks of the Tamsa.

Sorrow of Bihar

The Koshi River drains a large part of Bihar. It is sometimes called the 'Sorrow of Bihar'. This is because the river floods frequently, destroying vast areas of crops, and causing widespread human suffering in Bihar.

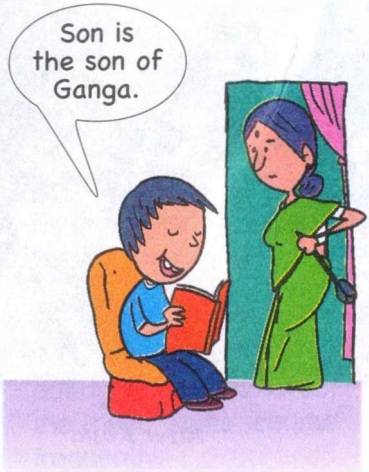
What are the features of the River Son?

The Son, a tributary of the Ganga, is one of the largest rivers in India.

It starts near Amarkantak in Madhya Pradesh, and has a total length of 784 km.

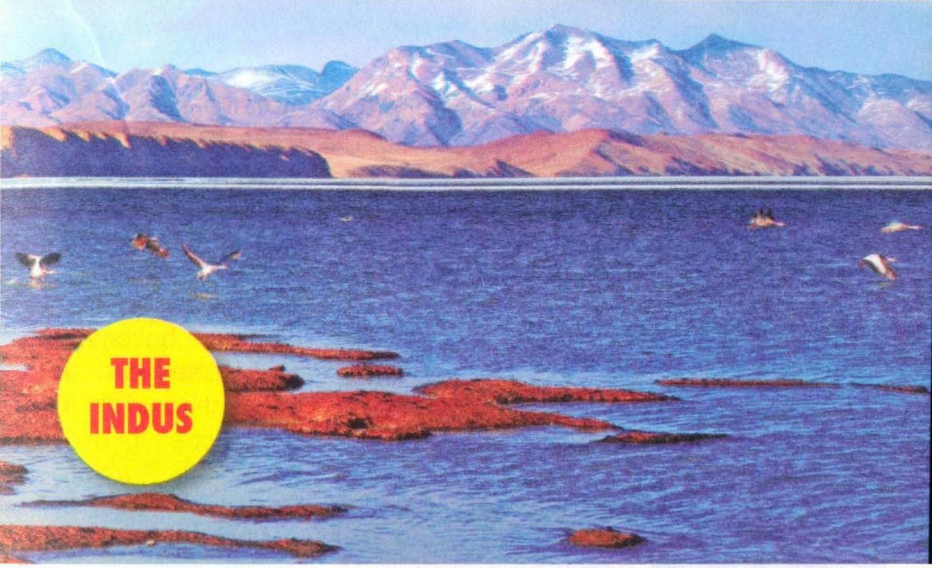
The Son's main tributaries are the Rihand and the North Koel. It flows through Uttar Pradesh, Jharkhand, and Bihar to join the Ganga just above Patna.

When fed by the monsoons, it becomes a roaring force.However, during the summer, it dries up in places, leaving large pools of water along its course.



The Indrapuri Barrage is located on the Son. It is one of the longest dams of India and it irrigates vast areas of agricultural land.

Ganga



Lake Manasarovar

Which are the major rivers in the Indus River System?

The Indus is also known as the Sindhu River. It has its source near Lake Manasarovar, high up in the Himalayas, in Tibet. The Indus flows for 2897 km, mostly through Pakistan. It also passes through India, and finally empties into the Arabian Sea.

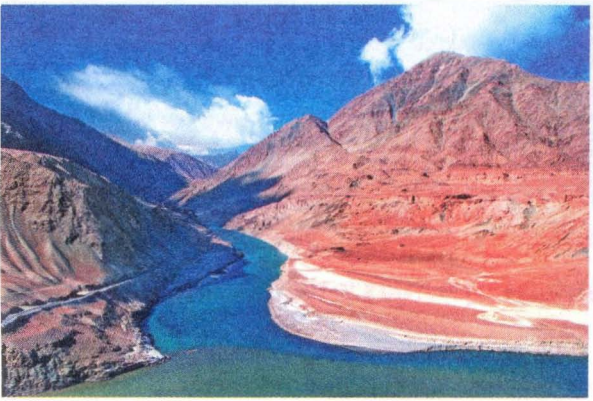
The main tributaries of the Indus in India are the Jhelum, Chenab, Ravi, Beas and Sutlej. These five rivers give Punjab its name, for the word 'punjab' means 'five rivers'.

Since the river moves very slowly across the plain, it deposits accumulated silt on its bed. The river bed is thus higher than the sandy plain. When the river is in flood, this results in much destruction.

The Indus finally branches into distributaries that join the sea at Karachi.

Which are the regions through which the Indus flows?

The Indus rises in the southwestern Tibet at a height of around 5500 metres. It flows through a high plateau, then the ground falls away, and the river drops rapidly, and gathers momentum.



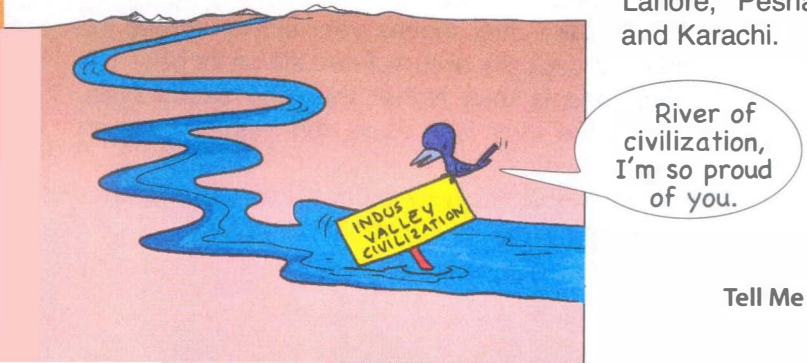
The confluence of Rivers Indus and Zanskar at Ladakh

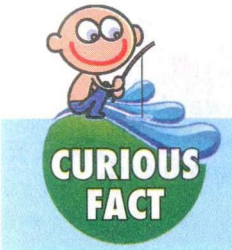
It rushes north-west, and collects the waters from innumerable glacier-fed streams. The Indus flows between the world's greatest mountain ranges, the Karakoram and the Himalayas.

Generally, the river becomes slower, and has a wider channel as it approaches its delta on the Arabian Sea.

Without the Indus waters, agriculture in Pakistan would be very uncertain. In addition, the Indus supplies essential ingredients for human life for many urban areas.

These include the Pakistani cities of Islamabad, Lahore, Peshawar and Karachi.





Longest River

The Indus is Pakistan's longest river. Its total length is 3180 km.

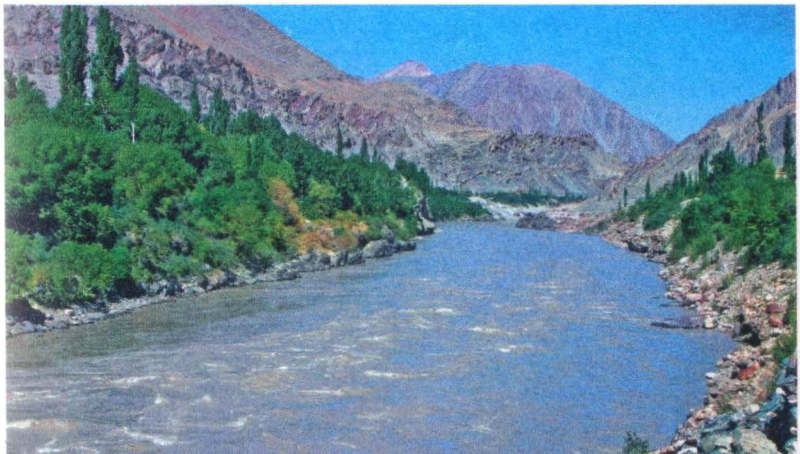
Why the Indus is called the cradle of civilization?

One of the greatest civilizations of ancient times flourished on the banks of the river Indus.

Around 3300 BC, there were two great cities in the Indus valley, Harappa and Mohenjo Daro. They were well planned, and had houses built of bricks, and even a proper drainage system.

The town planning, water supply, sewage and drainage system were of very high quality- there were bath houses and granaries in plenty, too.

These cities showed the world that the most sophisticated urban civilization of its time flourished in India, more than 5000 years ago! The wonders of engineering and architecture, the richness of the culture, and the quality of life enjoyed by the people all prove that the Indus Valley was indeed the cradle of civilization.

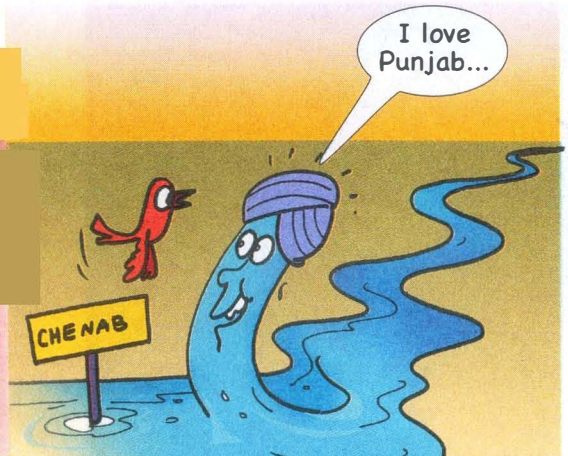


River Indus

Highest Rail Bridge

The world's highest railway bridge- the Chenab Bridge- spans the Chenab. It crosses the river in Jammu and Kashmir.

River Chenab



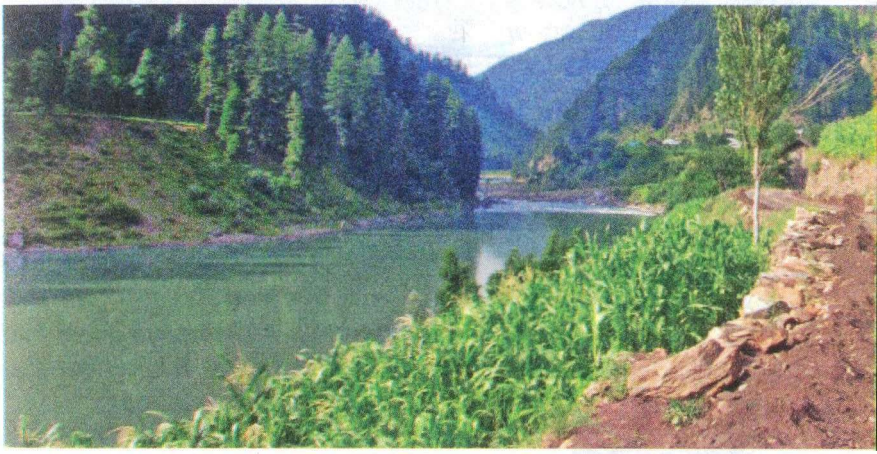
Why is the Chenab considered an important tributary of the Indus?

The Chenab rises in the Upper Himalayas, in the district of Himachal Pradesh in India.

Its waters begin from snow melt from the Bara Lacha Pass. During the Vedic period, the Chenab was known as Chandrabhaga, as it begins at the confluence of two rivers, the Chandra

and the Bhaga in Himachal Pradesh.

The Chenab flows through the Jammu, into the plains of Pakistan. It is joined first by the Jhelum, and then by the Ravi Rivers.



River Jhelum

Later, it meets the Sutlej, which had earlier been joined by the Beas. Together, these rivers form the 'five rivers' of Punjab. After, 960 km, the Chenab flows into the Indus.

The Chenab is dear to the people of Punjab. The river forms an important part of the land's history and culture.

Where does the River Jhelum begin?

The Jhelum is the largest, and most western of Punjab's five rivers. It is an ancient river that has been mentioned both by the Ancient Greeks as well as the acient Egyptians.

The Jhelum rises from a deep spring, the Verinag Spring in the south eastern part of the valley of Kashmir in India.

The river wanders northwards through the Valley of Kashmir to the Wular Lake. After emerging from the lake, it continues wind-

ing its way through a deep gorge into Punjab.

It widens out into an alluvial plain, and then goes south to join the Chenab at Trimmu after 813 km. Its flow is controlled by snow melt and the monsoon. In its lower course, the river is a source of hydroelectric power.

The Mangla Dam and Reservoir on the Jhelum irrigate around 3 million acres of land.

STAR FACT

A Canal

The Ravi irrigates a large area in Punjab through a canal. This canal is known as the Upper Bari Doab Canal.

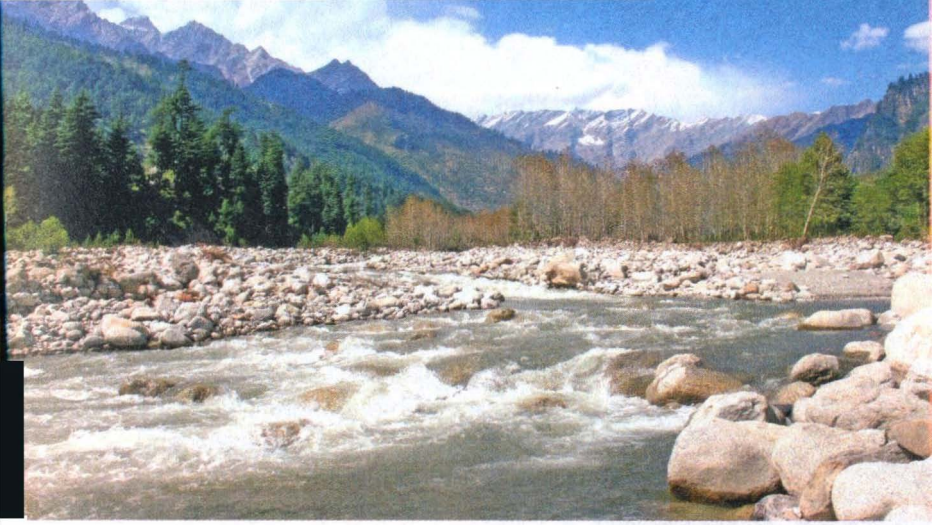
What are the features of the Ravi River?

The Ravi is one of the five rivers that give Punjab its name. It is a river that crosses national boundaries.

The Ravi rises in the majestic Himalayas in the state of Himachal Pradesh in India. It crosses Jammu and Kashmir, and then flows into Pakistan.

After 725 km, it empties itself into the Chenab. It is fed by glacial melt, and is the smallest of all the five rivers of Punjab.

In Vedic times, the Ravi was known as the Iravati, or Airavati River. The Ravi River, is a trans-boundary river of India and Pakistan. After partition, the waters of the Ravi were divided between India and Pakistan.



River Beas

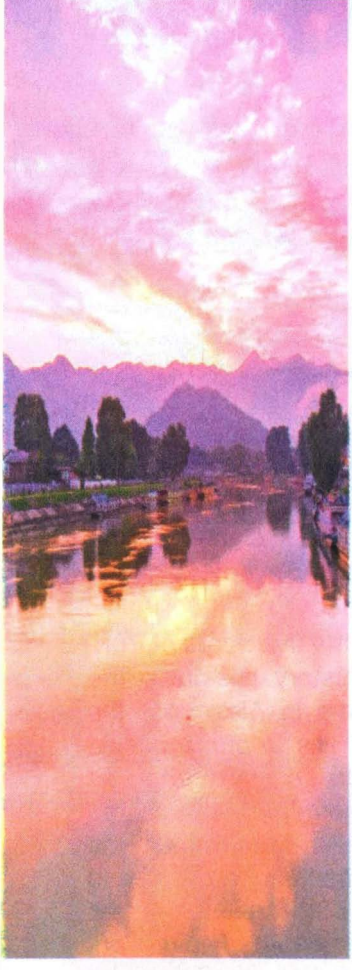
What is the significance of the River Beas?

The River Beas is one of the five rivers of Punjab that is famous in world history. It is one of the rivers that created problems in Alexander the Great's conquest of India. His troops mutinied here in 326 BC, refusing to go any further, as they had been away from home for eight years.

The Beas rises from the Rohtang Pass in the Western Himalayas of Himachal Pradesh, and flows south through the Kulu Valley. It then enters Punjab, and flows in a southerly direction. The Beas finally meets the Sutlej after flowing for 470 km.

The chief tributaries of the Beas are Bain, Banganga, Luni and Uhal. The river was known in Ancient India as the Vipasha, while the Ancient Greeks called it the Hyphasis.

In the 20th century, the Beas was developed for irrigation and hydroelectric power generation.



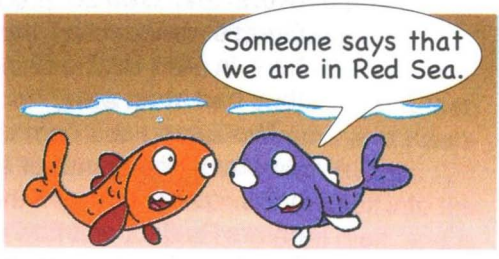
What is the importance of the Sutlej?

The Sutlej, the longest of Punjab's five rivers, has its source in the Rakshastal Lake in Tibet.

Sometimes called the Red River, it is the easternmost of the Indus River's tributaries. The Sutlej rushes through Himalayan gorges, and crosses Himachal Pradesh, before entering Punjab.

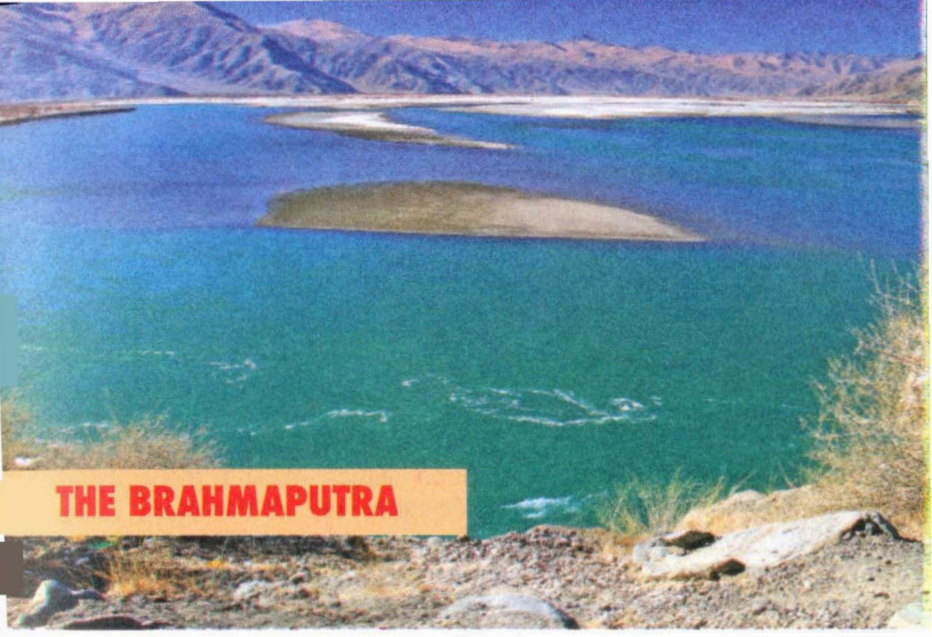
It then joins the Chenab and they empty into the Indus.

There are many irrigation projects along its 1400 km long course. They include the Bhakra-Nangal Project, and the Sirhind Canal. In addition, there is also the Sutlej Valley Project which benefits both India and Pakistan.



Descendants

In the villages of the Sutlej Valley you will still find descendants of the yak traders of olden times. These traders were known as the Zhang Zhung.



THE BRAHMAPUTRA

Why is River Brahmaputra a river without national boundaries?

The Brahmaputra is not a river that belongs to one country. It passes through three countries. From its source in the Himalayas, to its mouth in the Bay of Bengal it is around 2900 km long.

In this journey, it passes through Tibet, the Indian states of Arunachal Pradesh and Assam, and finally, Bangladesh.

The Brahmaputra has three headstreams in Tibet. From Tibet, the river enters Arunachal Pradesh in north eastern India. It winds through the mountains and then descends, into Assam.

It is known by several different names during its journey. The river becomes officially the 'Brahmaputra' only when it is about 1450 km away from the Bay of Bengal.

The Brahmaputra then enters the plains of Bangladesh. Finally, it forms a delta along with the River Ganga, as it reaches the Bay of Bengal.

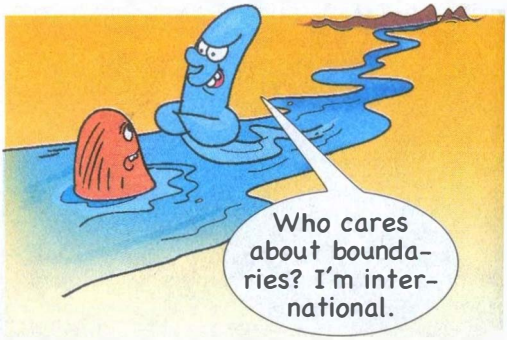
River Island

Majuli, or Majoli is a river island in the Brahmaputra River. Located in Assam, it is the largest river island in India.

What are some of the names the river Brahmaputra is known by?

The name Brahmaputra means 'Son of Brahma, the Creator.' While most Indian rivers have female names, the Brahmaputra is an exception.

However, in the course of its journey, the Brahmaputra is known by different names.



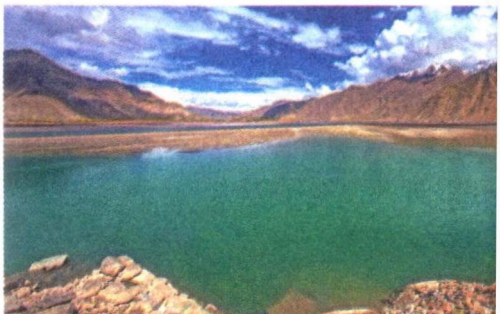
In Tibet it is called the Yarlung Tsangpo, which means 'the purifier'. The Chinese refer to the river as Yarlung Zangbo.

In Arunachal Pradesh, the river is known as the Siang. It is also called the Dihang River.

In Bangladesh, the river is known as the Jamuna. The Jamuna joins the Ganga, and the combined flows of these two rivers are known as Padma.

The Padma joins the another downstream. The united streams are thereafter known as the Meghna, and it is with this name that the river ends its journey.

Brahmaputra in Tibet



River Brahmaputra

Which are the important tributaries of the Brahmaputra?

In the course of its long journey from Tibet to the Bay of Bengal, the Brahmaputra is joined by many tributaries.

In Tibet, the river is known as the Tsangpo. Its main tributaries here are the Raka Zangbo, the Lhasa, and the Nyang Qu. The Raidak River is one of the main tributaries of the Brahmaputra River in the lower course.

The river is known as the Wong in its upper course in Bhutan. The Sankosh River is another tributary. It rises in northern Bhutan, and then flows into the Brahmaputra in the state of Assam.

In Assam, the Brahmaputra is known as the Siang. The Siang River meets two other major tributaries of the Brahmaputra, Dibang and Lohit at a place named Kobo.

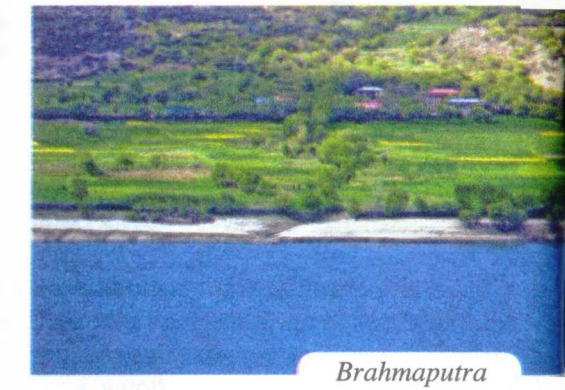
It is from this confluence point that the river is known as the Brahmaputra, till it enters Bangladesh. There, it has a main tributary, the Teesta River.

Blessing or Curse?

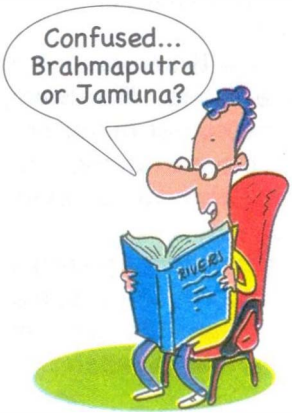
The Brahmaputra is a blessing to the regions it flows through, as it provides both irrigation and transportation. At the same time, it causes much sorrow to the people, because of its frequent floods that cause widespread destruction.

What is the importance of the Brahmaputra?

From its origin in southwestern Tibet, the Brahmaputra flows across southern Tibet, to break through the Himalayas in great gorges.



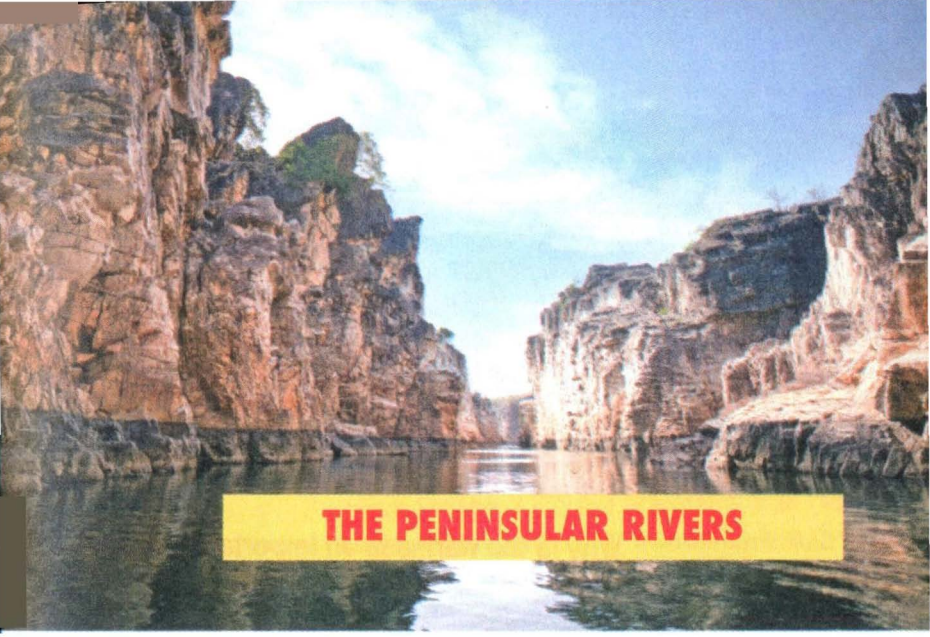
Brahmaputra



It flows southwest through the Assam Valley, and south through Bangladesh, where it is called the Jamuna. In Bangladesh, it merges with the Ganga to form a vast delta.

In India, it accounts for nearly 30 per cent of the total water resources, and about 40 per cent of the total hydropower potential of the country.

The Brahmaputra River is one of the few rivers in the world that exhibits a tidal bore, as in a sea.



THE PENINSULAR RIVERS

Narmada

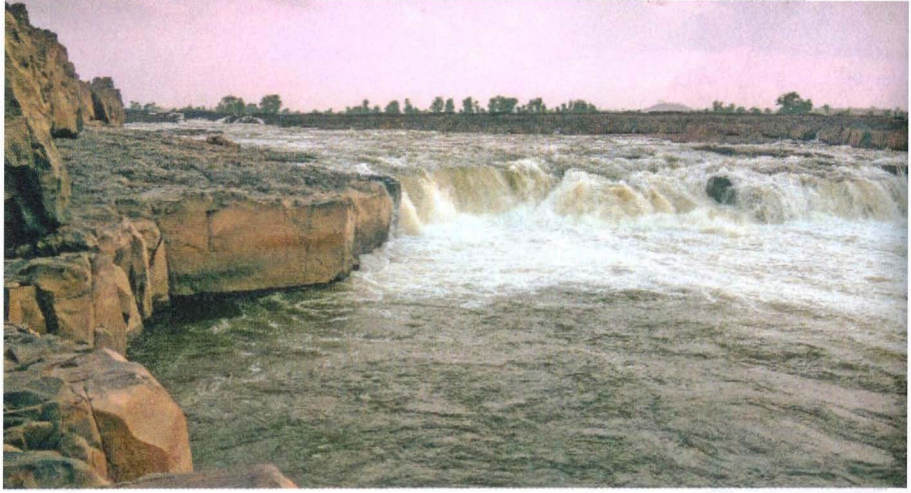
What are the features of the Narmada River?

The Narmada is one of the peninsular rivers that has its source in Central India.

The Narmada begins its journey from Amarkantak in Madhya Pradesh, and winds its way through Madhya Pradesh and Gujarat to enter the Gulf of Khambhat.

The river has many waterfalls and tributaries, and numerous cities and towns flourish on its banks. Since ancient times, the river has always been an important link between the Arabian Sea and the Ganga River Valley.

Today, it is known as the lifeline of Madhya Pradesh. The river and its 41 tributaries quench the thirst of millions, and irrigate almost 1 lakh hectare area in the state.



Sahastradhara Waterfalls in Narmada

Why is the Narmada an important peninsular river?

The Narmada rises from Amarkantak, in the Maikal ranges of Madhya Pradesh. It runs for 1312 km, and is the third longest river which has a course that is entirely within India.

The river flows from east to west, across the Indian peninsula, into the Arabian Sea. It merges into the ocean at the point called 'Bharonch'.

The Narmada flows through the states of Madhya Pradesh and Maharashtra, as well as along the border of Maharashtra, and Gujarat. As a result, millions of people, including the tribal population such as Gonds, Bhils, Santhals and Kurkus are heavily dependent on its water.

The Narmada basin has numerous dams. They provide water for irrigation and hydroelectric power to both rural and urban areas.

What are the features of the Tapti?

The Tapti, or Tapi River is an important river in Central India. It rises in the Satpura Ranges of Madhya Pradesh, and runs for 724 km through Madhya Pradesh, Maharashtra, and Gujarat before reaching the Arabian Sea.

The Tapti drains an area of 65,145 sq. km. It runs parallel to the Narmada which flows to the north of the Tapti.

The two rivers are separated by the Satpura Range. Like the Narmada, the Tapti also runs from east to west. The two river valleys and the mountain range between them create a natural barrier between northern and peninsular India.

The main tributaries of the Tapti River are the Purna, Girna, Panjhra, Vaghur, Bori and Aner.

Tapti River

What is the significance of the Tapti River?

The Tapti River is of great religious, economic, and ecological significance.

According to Hindu mythology, Tapti is the daughter of Surya, the Sun God. It is believed that Surya created the Tapti River in order to save himself from his own intense heat. Hindus consider the river a goddess.

The water of the Tapti River is widely used for irrigation purposes. The river is agriculturally very important as it drains an area of over 65,145 sq. km. spread over Madhya Pradesh, Maharashtra, and Gujarat.

In earlier times, Surat on the Tapti River was an important port from which goods were exported.

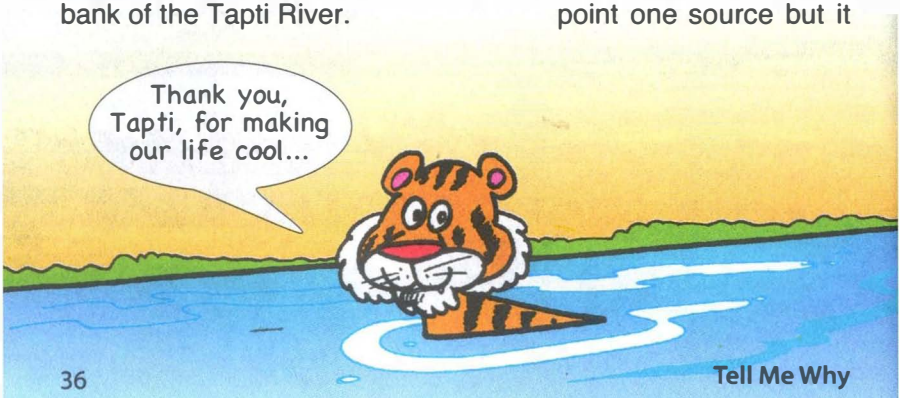
The Melghat Tiger Reserve in Amravati district, a part of Project Tiger, is situated on the southeast bank of the Tapti River.

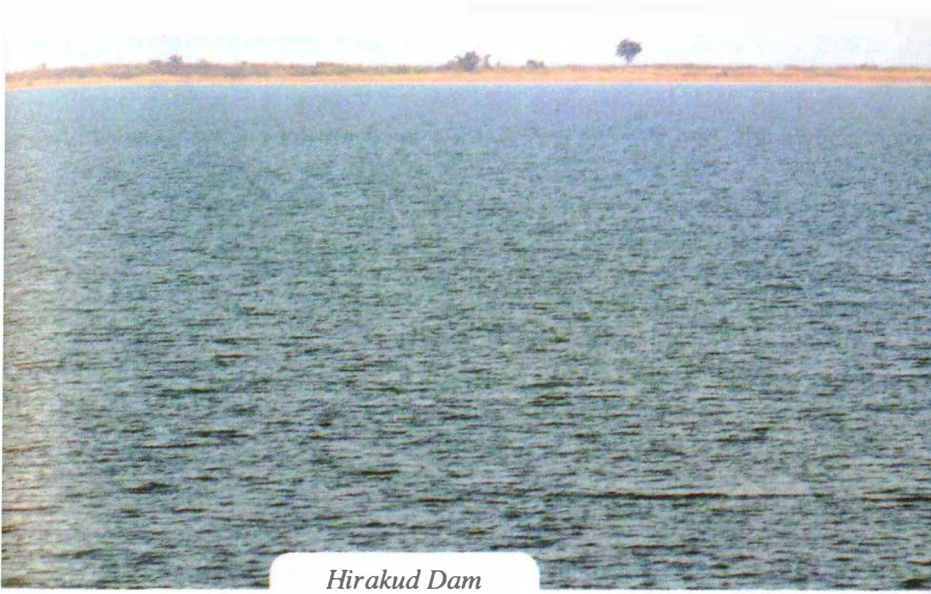
Tapti or Tapi

The Tapti River is also known as the Tapi. Thailand has a Tapi river too. It was named after the Indian river.

What are the features of the Mahanadi River?

The Mahanadi River is one of the great rivers of eastern Central India. It is impossible to pinpoint one source but it





Hirakud Dam

flows first as a rather narrow stream through the Chhattisgarh plain.

Later, it is joined by the Seonath River, and becomes wider as it enters Odisha State. The river then winds its way through the Eastern Ghats, before entering the Odisha plain. The Mahanadi's 858 km journey finally ends at the Bay of Bengal.

The Mahanadi drains an area of around 141,600 square kilometres. It was notorious for its devastating floods.

However, the situation changed with the construction of the Hirakud Dam. Today a network of canals, barrages and check dams keep the river well in control.

Hirakud Dam

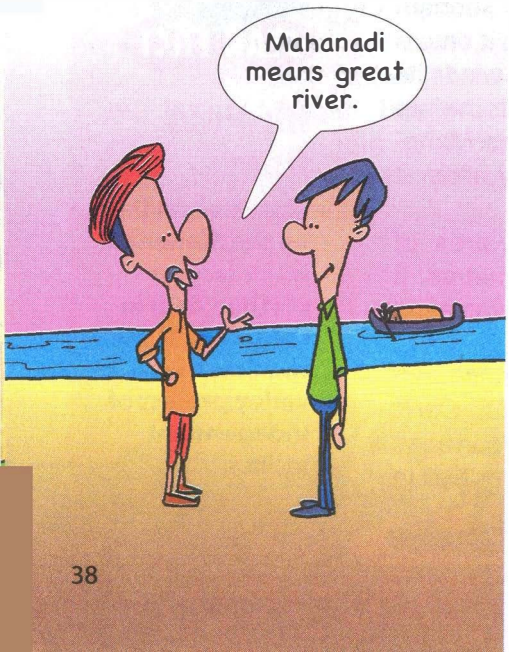
The Hirakud Dam on the Mahanadi is the largest earthen dam in the world. It was the first river valley project of independent India.

What is the importance of the Mahanadi River?

The Mahanadi is a major river in Odisha, and like all Indian rivers, it is a revered one. It plays a major role in the life of people, and is part of all the major religious functions and festivals.

Many important cities have sprung up along its banks, including Raipur and Cuttack. The Hirakund Dam near Sambalpur is a major landmark on the banks of the Mahanadi.

The dam was the longest in the world when it was constructed in 1957.



Today, it is a major tourist attraction for travellers. The Hirakund Dam regulates the flow of the Mahanadi, and produces hydroelectricity.

The dam has formed a manmade lake, which is 55 km long. This important river also irrigates a fertile valley whose chief crops are rice, oilseed, and sugarcane.

What are the main features of the Godavari River?

The Godavari, the second longest river in India after the Ganga, has its source in the Western Ghats of Maharashtra.

It then flows eastward across the Deccan Plateau to enter Telengana. The Godavari crosses Andhra Pradesh to enter the Bay of Bengal through a delta.

Like most rivers in India, the Godavari too, is a sacred river. Every twelve years, a major festival

Godavari

known as the Pushkaram is held on the banks of the Godavari River.

The Godavari flows for 1465 km, and has one of the largest river basins in India. The second largest mangrove forest in the country is found on the banks of the Godavari.

Important dams on the river provide hydroelectric power and irrigate vast areas to nurture the land and its people.

The Godavari's delta, along with the delta of the Krishna River, is known as 'The rice granary of South India'.

Tributaries

The Godavari is joined by many tributaries as it flows towards the Bay of Bengal. These tributaries include the Penganga, Pranahita, Sabari, Wardha, Indravati, Manjeera and Manair.

River Krishna

INS Godavari

The Godavari is not the name of just a river. It is also the name of a ship in the Indian Navy. The INS Godavari has been named after the mighty river.

What is the importance of the Krishna River?

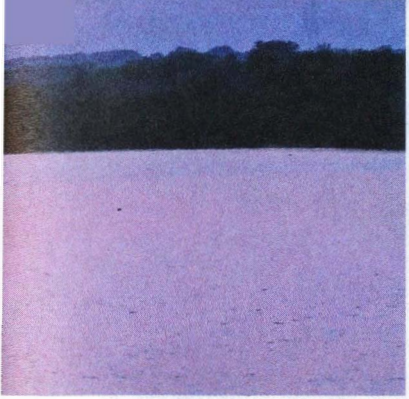
The Krishna, one of India's longest rivers, flows for almost 1400 km through south central India.

It rises in the Western Ghats of Maharashtra, and drains large areas of four states- Maharashtra, Karnataka, Telengana, and Andhra Pradesh.

The Krishna is an important source of irrigation for the states it flows through. It has a large and highly fertile delta that joins that of the Godavari to form 'the rice granary of South India'.

There are many pilgrimage centres on the banks. The last surviving mangrove forests in the Krishna estuary have been declared as the Krishna Wildlife Sanctuary.

The sanctuary is home to a large number of resident and migratory birds, as well as a wide variety of animals. The river is revered as sacred.



Which are the tributaries of the Krishna River?

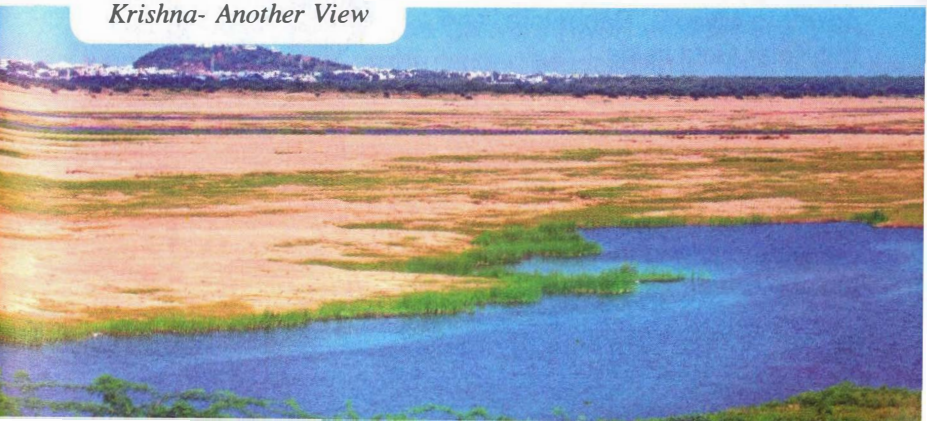
The Krishna River has many tributaries that join it in its 1400 km journey from the Western Ghats in Maharashtra to the Bay of Bengal.

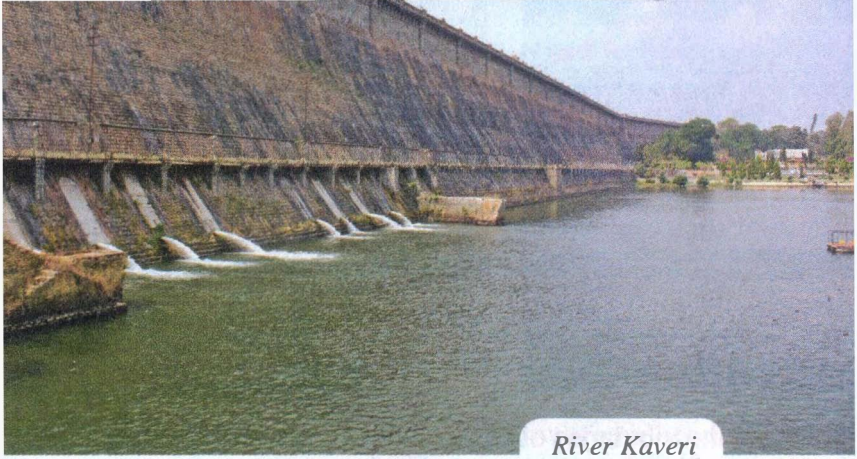
These tributaries are the main source of water in the Western Ghats. The Tunga and the Bhadra rivers join in the Western Ghats to form the Tungabhadra, which is the main tributary of the Krishna.

However, the longest tributary is the Bhima River, which has a length of 861 km. The Warana and the Panchganga meet the Krishna near Sangli.

Four other rivers, the Venna River, Urmodi River, Tarli River and Koyna River join the Krishna in Satara District. The confluence is popularly known as Preeti Sangam.

Krishna- Another View





River Kaveri

Where is the source of the Kaveri River?

The Kaveri- or Cauvery River as it is also known- rises in the Brahmagiri Hills of the Western Ghats in Karnataka.

The river flows mainly through the states of Karnataka and Tamil Nadu. It tumbles down the Eastern Ghats in a series of waterfalls.

The Shivanasamudra Falls on the Kaveri supplies hydroelectric power to Mysore, Bangalore, and the Kolar Gold fields.

The Mettur Dam in Tamil Nadu has created an important agricultural and industrial area by improving irrigation and providing hydropower to the state.

Before entering the Bay of Bengal, the Kaveri forms a wide delta, which is often referred to as 'the Garden of South India'.

The Kaveri too is considered to be a holy river, and is sometimes called Dakshina Ganga, or the Ganga of the South.

Kaveri- Another View

Jeevanadhi

The Kaveri is called the Jeevanadhi in Karnataka. In Kannada, this means 'the river supporting life' – and that is exactly what the Kaveri is.

Which are the tributaries of the Kaveri?

The Kaveri's basin covers Tamil Nadu, Karnataka, Kerala, and Puducherry. East of Mysore it forms the island of Shivanasamudram.

The tributaries of the Kaveri are important rivers in themselves. One of the tributaries of the Kaveri River is the Shimsha River.

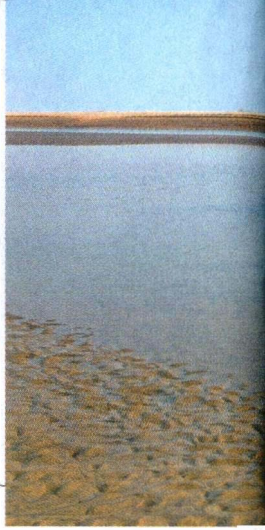
The total length of this tributary is two hundred and twenty one kilometres. Another important tributary is the Hemavati.

The Bhavani River, another tributary, is the second largest river in Tamil Nadu. It is two hundred and seventeen kilometres long, and flows through the states of Kerala and Tamil Nadu.

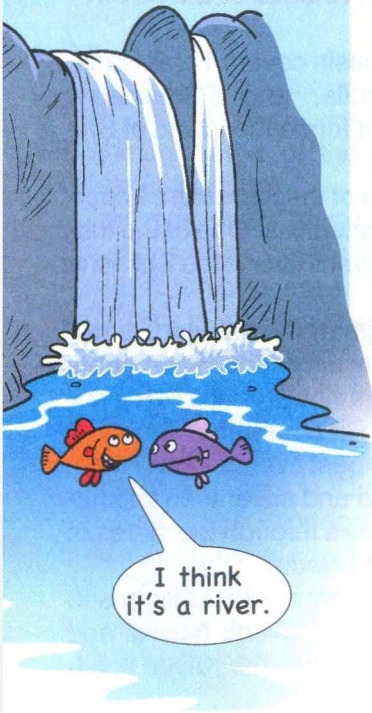
The Arkavati, Honnuhole, Lakshmana Tirtha, Kabini, Lokapavani, Noyyal and Amaravati rivers all join the Kaveri at different points.

Golden River

Gold used to be mined near the origin of the River Subernarekha. In fact, the name 'Subarnarekha' means 'streak of gold'.



Subernarekha



What are some of the features of the Subernarekha?

The Subernarekha is an interstate river, that winds its way across Jharkhand, West Bengal, and Odisha. It has its source near Ranchi, the capital of Jharkhand.

It flows the longest distance through Jharkhand, and shorter distances through West Bengal and Odisha, before finally reaching the Bay of Bengal after 395 km.

The river has many tributaries, including the Kharkai, Roro, Kanchi, Harmu Nadi, Damra, Karru, Chinguru, and others.

The spectacular Hundru falls are created when the Subarnarekha tumbles down from a height of 98 metres,

creating incredible rock formations.

The Getalsud reservoir is located across the Subernarekha to meet municipal water demands of Ranchi city and the adjoining industrial area.

What is the significance of the Brahmani River?

The Brahmani River starts at the confluence of the Sankh and South Koel Rivers near Rourkela.

The Sankh has its source near the Jharkhand Chhattisgarh border, while the South Koel also originates in Jharkhand.

A major portion of the Brahmani flows through Odisha. In fact, it is Odisha's second longest river, with a length of 480 km. There are several dams across the river, which meet the irrigation and hydroelectric power needs of the regions through which it flows.

Together with the rivers Mahanadi and Baitarani, the Brahmani forms a large delta before emptying into the Bay of Bengal. The main tributaries of Brahmani River besides the Sankh and South Koel are the Karo and Tirka Rivers.

AMAZING

Nagarjuna Sagar

The Nagarjuna Sagar is built across the Krishna River. It is the world's largest masonry dam.

Why is the River Mandovi known as the lifeline of Goa?

The Mandovi River originates from a cluster of thirty springs in the Western Ghats of Karnataka.

It flows for 77 km, first through Karnataka for 29 km, and then through Goa, to eventually pour into the Arabian Sea.

Panaji, the capital of Goa, is situated on the banks of the river. The Mandovi joins with the Zuari River at a common point at Cabo Aguada to form the famous Mormugao harbour.

The river is connected to its tributary the Mapusa River by the Cumbarjuem Canal. This canal has made the interiors of the Mandovi accessible to ships carrying iron ore, which plays a key role in Goa's economy.

The Mandovi also has three large freshwater isles. The island of Chorao, is home to the Salim Ali Bird Sanctuary, named after Salim Ali, the famous ornithologist.

Sabarmati Ashram

During the independence struggle, Mahatma Gandhi made the banks of the Sabarmati his home. He established an ashram there which has become world famous. It is called the Sabarmati Ashram.

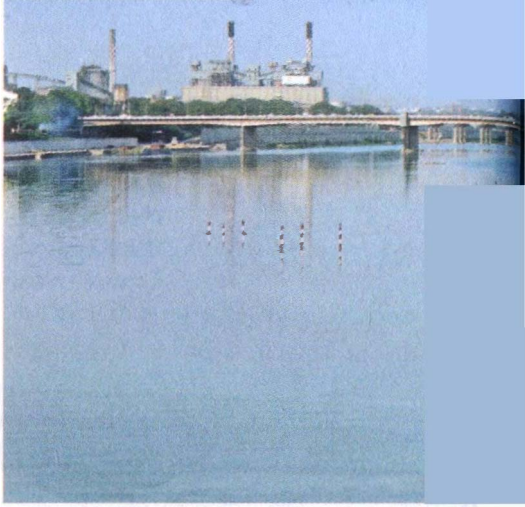
Sabarmati

What are the main features of the Sabarmati River?

The Sabarmati River originates in the Aravalli Hill of Rajasthan and ends in the Bay of Khambhat in the Arabian Sea.

One of the biggest rivers in Gujarat, it flows for 371 km through two states- Rajasthan and Gujarat.

Which are the tributaries of the Sabarmati?



The Sabarmati River is joined by its tributaries in its journey from the Aravalli Hills to the Arabian Sea.

The main tributaries of the Sabarmati River are the Wakal River and the Sei Nadi. The Wakal River begins its journey from the hills near Ghora village in Rajasthan.

It flows for 112 km across Rajasthan, and then enters Gujarat. The Manas is a tributary of the Wakal. The Sei Nadi also rises in the Aravalli Hills.

Both these rivers flow south westwards. Their courses run generally parallel to the Sabarmati until they join it. The political and commercial

In fact, two important cities in Gujarat, Ahmedabad and Gandhinagar are both on the banks of the Sabarmati.

The banks of the Sabarmati are also extremely fertile and thickly populated as both agriculture and industries flourish here.

What is distinctive about the Thamirabarani River?

The Thamirabarani is an important river in Tamil Nadu. It rises from the Agastyakoodam peak in the Western Ghats.

The forty metres high Vanatheertham waterfalls are located near the origin of the River. The Thamirabarani flows through the Tirunelveli and Tuticorin districts before emptying into the Gulf of Mannar in the Bay of Bengal.

Sabarmati River

capitals of Gujarat- Gandhi Nagar and Ahmedabad- are both on the banks of the Sabarmati.

The Sabarmati and its tributaries are the primary sources of water in Gujarat and in parts of Rajasthan.

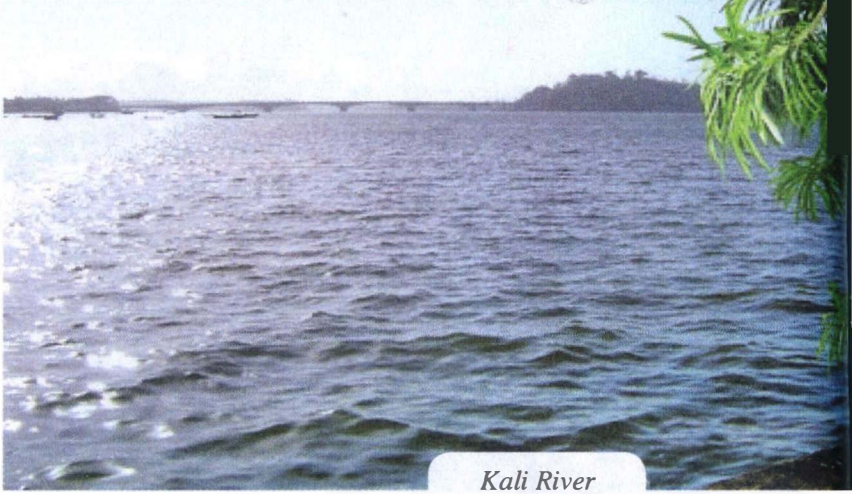
The river is 125 km in length, and is joined at different points during its course by several tributaries.

The Thamirabarani is fed by these tributaries as well as by the monsoons.

The water of this river has a distinctive reddish tinge as it has small amounts of copper in it. In Tamil, copper is called Thamiram, and hence the river is named Thamirabarani. In the past, the river was called Podhigai.

Chorao

Chorao is one of the three freshwater isles in the Mandovi River. It is renowned for its bird sanctuary that is called the Salim Ali Bird Sanctuary.



Kali River

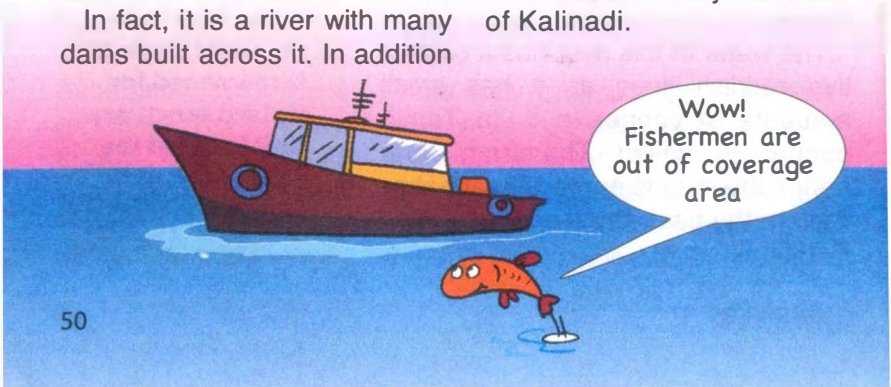
What is special about the Kali River?

The Kali River rises in the Western Ghats of Karnataka. It has many tributaries, including the Tattihalla and Kaneri, and ends its journey in the Arabian Sea.

The Kali first flows eastwards into the Supa Dam Reservoir where it is joined by the Pandri River.

In fact, it is a river with many dams built across it. In addition to the Supa, Ganeshgudi is also an important dam on the Kali.

These dams provide hydro-electric power to thousands of people, and also irrigate vast areas. The Kali is therefore, considered to be the lifeline for the four lakh people that live around it, including the fishermen of the Karwar coast. The Kali River is also known by the name of Kalinadi.



What are the features of the Purna River?

The Purna is one of the main tributaries of the Tapti River. It rises in the East Satpura Range of Madhya Pradesh, and flows westward, draining Maharashtra's Vidarbha region before flowing into the Arabian Sea.

The eastern parts of the basin cover a chain of rugged mountain ranges of the Western Ghats. This hilly zone then merges into the plains.

There is also coastal zone running parallel to the sea. The chief tributaries of the Purna on the south bank are the Pendhi, Uma, Katepurna, Nirguna and Mann.

The Katepurna is the largest of all the tributaries. The Purna supplies water to the Malkapur region. Many towns like Kholapur and Assegaon have grown up along its banks.

The Purna is one of the most important rivers of Western India.

Purna is Complete

'Purna' is a Sanskrit word. It means 'complete'. The Purna River was also called as 'Payoshni' or 'Paisani' which are Sanskrit words meaning 'ambrosia'.

Purna River

STAR FACT

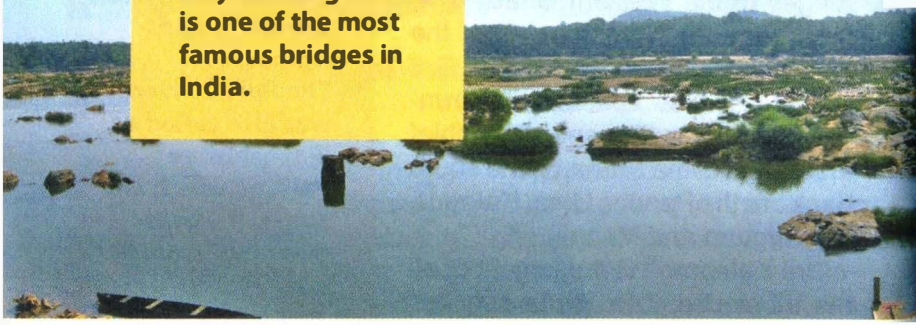
Gateway to Mangalore

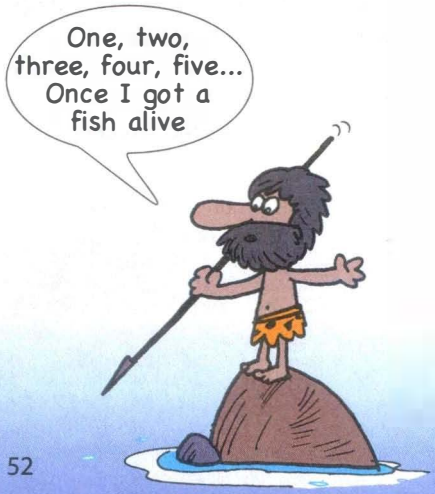
The Netravati bridge is known as the gateway to Mangalore. It is one of the most famous bridges in India.

Why is the Netravati considered a holy river?

The Netravati River rises in the Chikkamagaluru district of Karnataka, in the Western Ghats.

It is considered one of the holy rivers of India, as it flows





What is the historical importance of the Shetrunji River?

The Shetrunji River is the second largest river in Saurashtra. It rises north east of the Gir Hills, and flows for 227 km before reaching the Gulf of Cambay.

The river crosses both hills and plains before emptying into the Gulf through

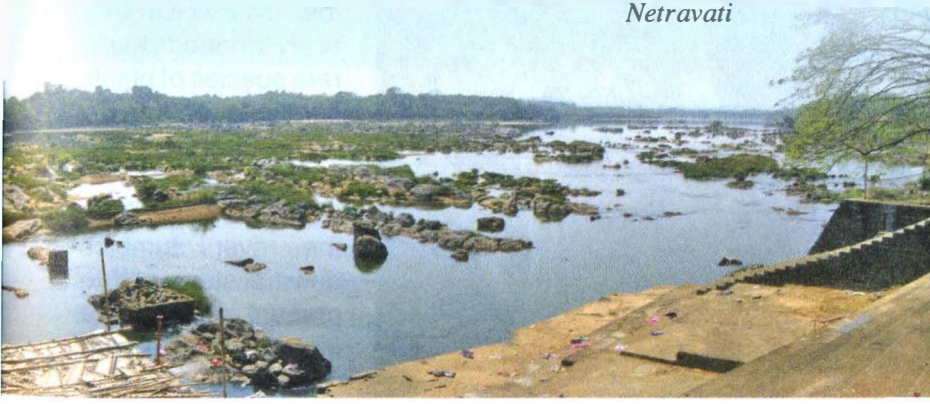
through a famous place of pilgrimage, Dharmasthala.

At places, its bed is covered with large rocky masses, chiefly of hornblende rock.These contain spangles of mica and small garnets. The beds of its rivulets have sienites, as well as fragments of a beautiful pegmatite with flesh coloured feldspar.

Consequently, at many places the Netravati can be navigated only in small boats.

Many mini hydroelectric projects and diversion project have been set up on this river.

Netravati

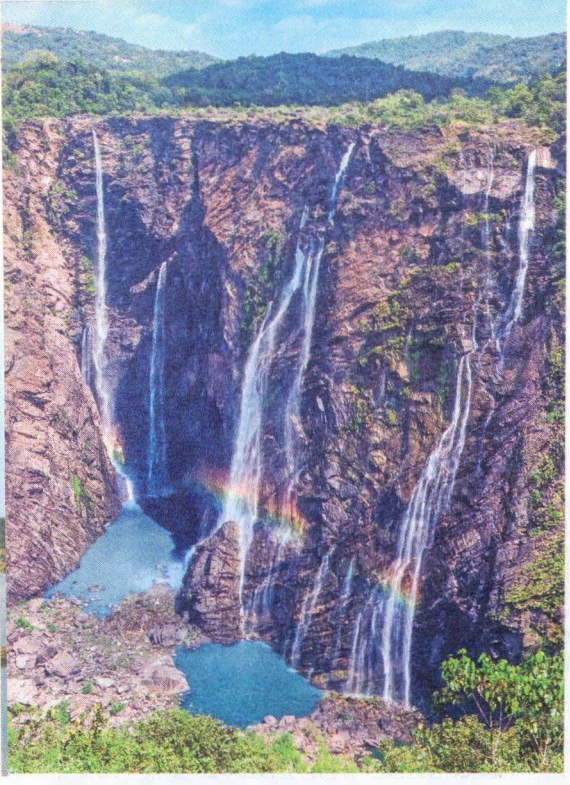


two mouths. The river is of historic importance for the archaeological sites that have been discovered along its course. The river has its own religious significance too.

These sites date back to the Middle to Upper Palaeolithic Ages. Archaeologists have also discovered 22 settlements, which include nine fishing villages, in addition to a village where both agriculture and fishing were the main occupations.

They also discovered a village where both regular farming and salt farming were carried out.

The Palitana temples near the river are important places of worship for the Jain community. The Palitana dam was built in 1959 across the river.



Jog Falls in Sharavati River

What is the Sharavati River famous for?

The Sharavati River, which flows entirely within the state of Karnataka, is one of the few westward flowing rivers.

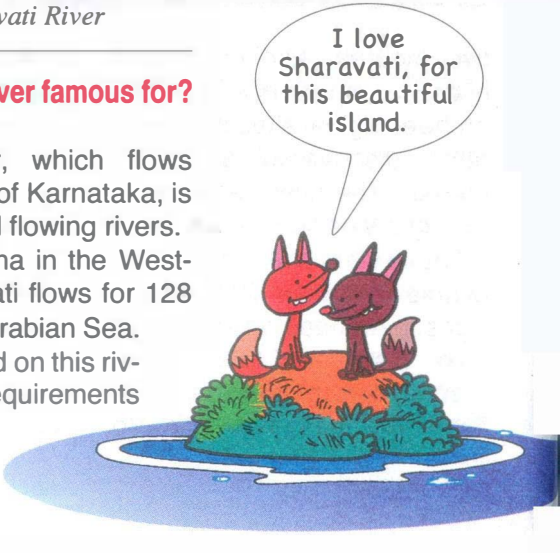
Its origin is Ambuthirtha in the Western Ghats. The Sharavati flows for 128 km before meeting the Arabian Sea.

A dam was constructed on this river to meet the power requirements of Karnataka state.

As a result, large areas of forest were submerged. One hundred and twenty-five islands were also formed in the reservoir created by the dam.

The islands and the river basin are richly forested. Many rare species of plants can be found here.

The Sharavati River is most famous for the Jog Falls. Here, the river tumbles down a steep cliff to present a truly awe inspiring spectacle.



Periyar

Why is the Periyar special to Kerala?

With a length of 244 km, the Periyar, is the longest river of Kerala.

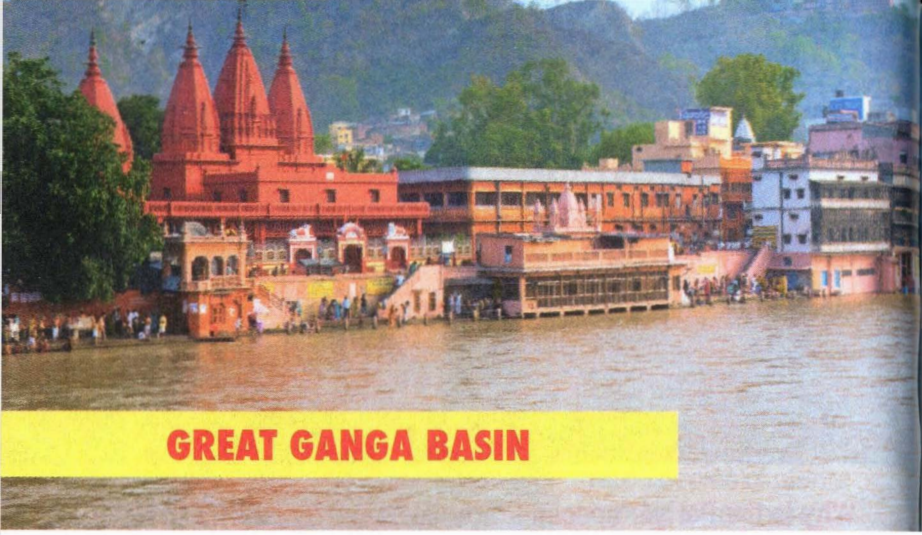
It is an important source of drinking water, and a major player in generating hydroelectric power for Kerala. The largest of these is the Idduki Hydroelectric Project, which supplies electricity to most of the state. Other dams constructed across the river are Neriyamangalam, Pallivasal, Panniyar, Kundalam, Chenkulam, and Mullaperiyar.

Tourist destinations like the Thattakad Bird Sanctuary and Thekkady Wild life Sanctuary are on the banks of this river.

The Periyar has religious significance too. The birthplace of Sankaracharya, the greatest Advaita philosopher is at Kalady, which is on the bank of the Periyar. Malayattoor and Aluva, on the banks of this river, are pilgrimage destinations for Christians and Hindus respectively as well.

The Origin

The Periyar rises in the Western Ghats, and ends its journey in the Arabian Sea.



GREAT GANGA BASIN

What are the regions covered by the Ganga Basin?

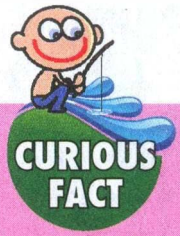
The Ganga and its tributaries have created a large, flat, and fertile plain known as the Ganga River basin.

The basin of the river Ganga is a vast one. It stretches across India, from the Himalayas in the North, to the Vindhya Range in the south, from the Aravalli range in the west, to the Sunderbans delta in the east.

The Sunderbans are swamplands and tidal forests found on the seaward side of the river's delta.

The Ganga River basin is one of the most fertile and densely populated in the world, and covers an area of 1,086,000 sq. km.

The water supply to the river depends on the rains brought by the monsoon winds from July to October, and the melting snow from the Himalayas during the period from April to June.



Population

The Ganga basin has a population of more than 500 million. This makes it the most populated river basin in the world.

Why is the Ganga Basin important to the Indian economy?

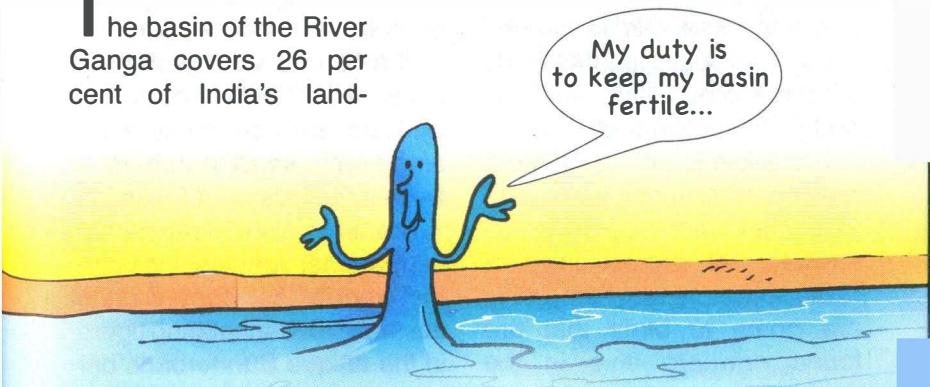
The basin of the River Ganga covers 26 per cent of India's landmass, 30 per cent of its water resources, and more than 40 per cent of its population.

There are some 30 cities, 70 towns, and thousands of villages along the banks of the Ganga. The basin plays a significant role in the Indian economy.

The Ganga and its tributaries provide irrigation to a vast area. The soil is very fertile, and agriculture is an important means of livelihood for the people living here.

The chief crops cultivated in the area include rice, sugarcane, lentils, oil seeds, potatoes, and wheat.

Fisheries along the river are of considerable economic value too. In addition, many major industrial towns are also situated along the banks of the Ganga and its tributaries.



A Sambar in Ganga River Basin

What are some of the animals found in the Ganga Basin?

The Ganga River Basin is home to three wildlife sanctuaries- the Rajaji National Park, the Jim Corbett National Park, and Dudhwa National Park.

The basin is rich in different species of animals, birds, and fish. There are over 140 fish species, 90 amphibian species. Some areas of the basin are home to birds that are found nowhere else in the world.

The endangered Ganges river dolphin is found here, as well as a rare variety of freshwater shark. Deer, boars, and wildcats are commonly seen, along with small numbers of wolves, jackals, and foxes.

There are also 35 reptile and 42 mammal species, including the world's last population of the mangrove-inhabiting tigers, in the unique Sunderbans delta mangroves.

What is a river delta?

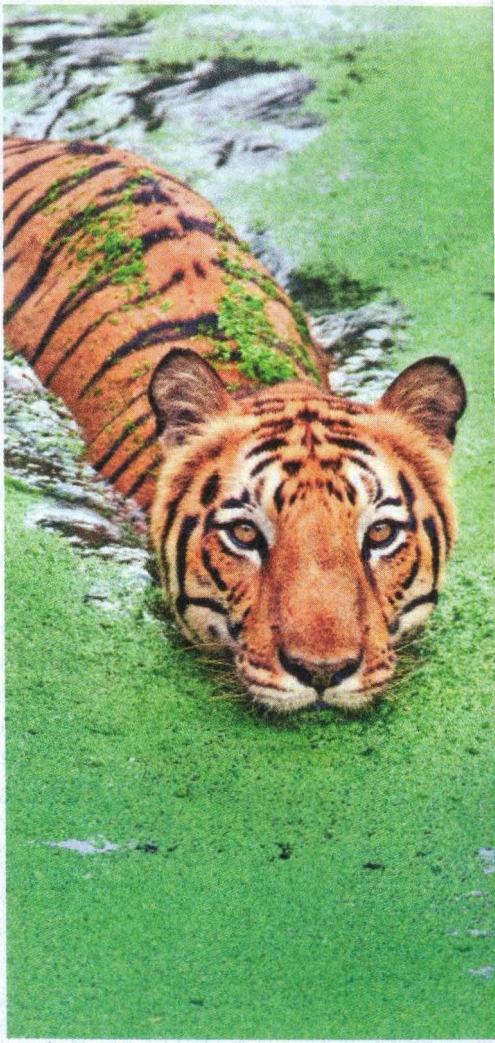
When a river reaches a lake or the sea, the water slows down.

As a result, the sediment that it is carrying, settles down on the river bed. Sediment refers to the mud, soil, pebbles, and small stones that are carried away by the river as it flows.

As the speed of the river's flow lessens, sediment is dropped at the mouth of the river. Some rivers drop so much sediment that waves and tides can't carry it all away. It builds up in layers, forming a delta.

Deltas have a fairly flat section called a delta plain, which is above water. The river cuts many small channels through the delta plain.

These channels are called distributaries. New sections of delta build up at the mouths of the distributaries. There are many river deltas in India. The delta at the mouth of the Ganga is the biggest of them all.



A Bengal Tiger in Sundarbans National Park

Sundarbans Delta

What are the features of the Ganga Delta?

The delta of the River Ganga is also known as the Ganges-Brahmaputra Delta, the Sunderban Delta, or Bengal Delta.

It is located at the place where the Ganges and Brahmaputra rivers empty their waters into the Bay of Bengal.

A number of large rivers flow through the Ganges Delta, including the Padma, which is a distributary of the Ganga, and the Jamuna which is a distributary of the Brahmaputra.

These rivers merge, and then join the Meghna, before entering the sea. The delta stretches from the Hooghly River on the west, to the Meghna River on the east.

It is approximately 354 km across at the Bay of Bengal. It is the world's largest delta, and is also called the Green Delta because it is one of the most fertile regions in the world.

Mangroves

The seaward side of the delta of the Ganga is known as Sunderbans. There are 54 islands in the Sunderbans. The world's largest mangrove forests are found here.

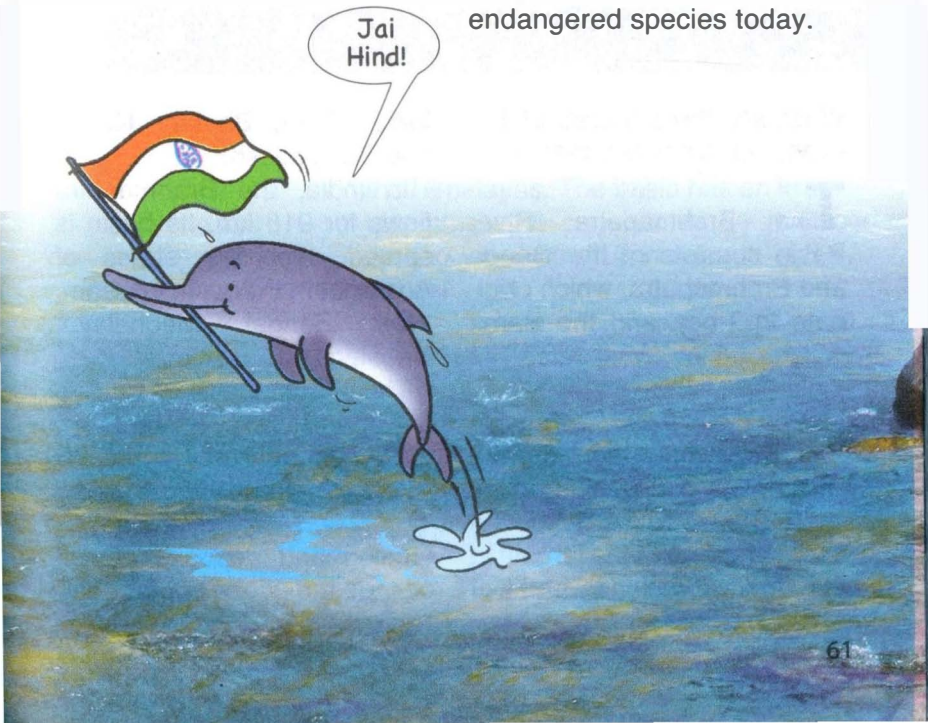
What is special about the Ganges river dolphin?

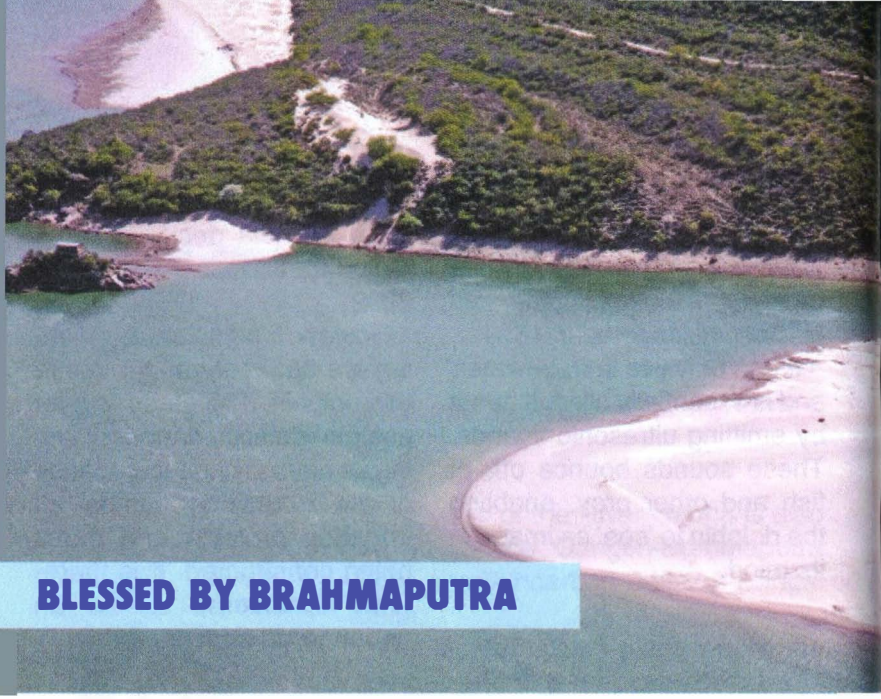
Dolphins are one of the oldest creatures in the world. The Ganges river dolphin is a freshwater dolphin that was officially discovered in 1801.

It can only live in freshwater, and is essentially blind. It hunts by emitting ultrasonic sounds. These sounds bounce off, of fish and other prey, enabling the dolphin to 'see' an image in its mind.

The Ganges river dolphin is important because it is a reliable indicator of the health of the entire river. The government of India declared it the national aquatic animal in 2009.

However, pollution and fishing are both serious threats to this dolphin. The Ganges river dolphin is also in danger of losing its natural habitat, because of the increasing number of irrigation projects and dams being constructed. It is therefore, considered to be an endangered species today.





BLESSED BY BRAHMAPUTRA

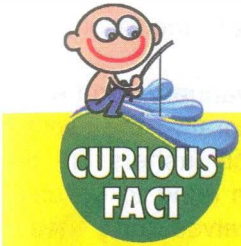
What are the features of the Brahmaputra River Basin?

The Brahmaputra River Basin consists of the Ganga and Brahmaputra, which originate in Tibet, and the Barak River, which originates in India.

These rivers all converge in Bangladesh as the Meghna River. The Meghna empties into the Bay of Bengal. The river basin is one of the largest in the world. It includes parts of India, Tibet, Bhutan, Nepal, and Bangladesh.

In India, the Brahmaputra flows for 916 km. Its basin is spread over the states of Arunachal Pradesh, Assam, West Bengal, Meghalaya, Nagaland and Sikkim.

The Brahmaputra basin has a number of oxbow lakes. An oxbow is a crescent-shaped lake lying alongside a winding river. It is created over time, as erosion and deposits of soil change the river's course.



Powerful River

The Brahmaputra's flow rate is the fifth highest in the world. This means that it is a very powerful river indeed.

What are the boundaries of the Brahmaputra River basin?

The Brahmaputra River flows through three countries- Tibet, India, and Bangladesh, before joining the Bay of Bengal.

Although the river does not flow through Bhutan, 96 percent of Bhutan lies in this basin too.

In India, the basin extends to six states. They are Arunachal Pradesh, Assam, West Bengal, Meghalaya, Nagaland and Sikkim.

The Brahmaputra River Basin is bounded by the Himalayas on the North, and by the Patkari range of hills on the east.

In the south, there are the hills of Assam while it is separated from the Ganga Basin on the west by a ridge of the Himalayas. The basin has an irregular shape. It consists of 54 rivers, among which, the Brahmaputra is the largest.

Brahmaputra Basin

What are the climatic conditions in the Brahmaputra River basin?

Overall, the climate in the Brahmaputra River Basin varies from the harsh, cold, and dry conditions of Tibet, to the hot conditions prevailing in Assam and Bangladesh.

The Indian portion of the Brahmaputra River Basin has four seasons. They are winter, summer, monsoon, and autumn.

December, January and February are generally the winter months. March ushers in the summer. From June to October, the basin receives fairly heavy rainfall. Cherrapunji, which falls in the Brahmaputra basin, has the highest rainfall in the world-11,872 mm per annum.

October and November are the autumn months, when the weather is generally very pleasant.

What is the economic importance of the Brahmaputra River Basin?

The Brahmaputra River basin is rich in natural resources. The soil is fertile, and is suitable for growing a wide variety of crops that make an important contribution to the Indian economy.

A Tributary of Brahmaputra

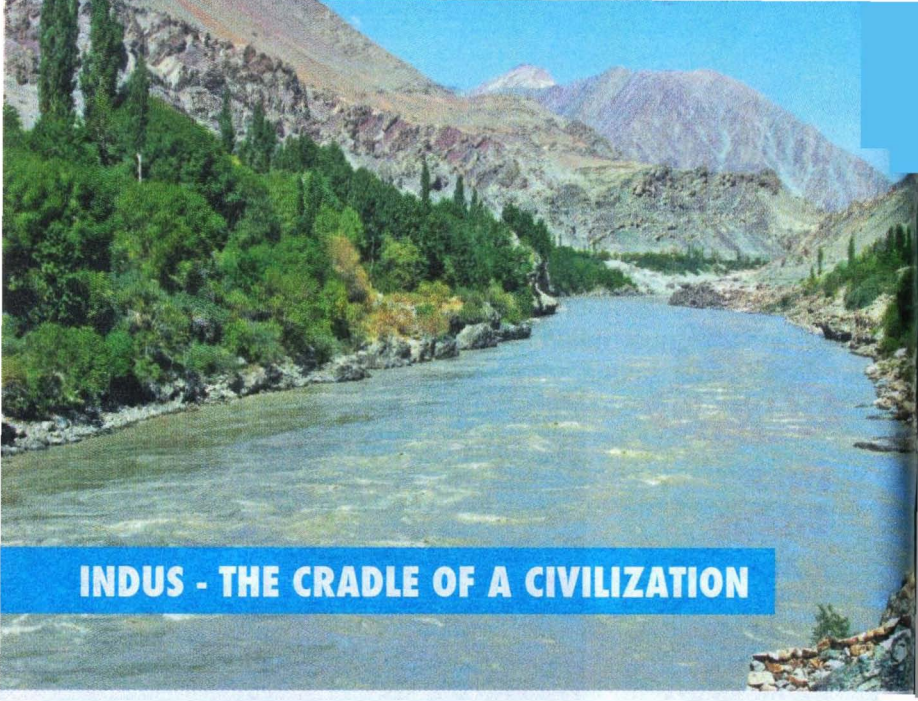
One of the most important crops is jute, which is exported all over the world to earn valuable foreign exchange.

There are also rich deposits of petroleum and coal. In fact, Digboi in Assam was the only source of petroleum in India until 1954. Petroleum products, drugs, and pharmaceuticals are important industries that have flourished in this area.

Major towns like Guwahati, Siliguri and Shillong are located in the Brahmaputra River Basin as well.

First Bridge

In April 1962, the first bridge to be built across the Brahmaputra was opened to the public. It was the Saraighat Bridge in Assam, near Guwahati.



INDUS - THE CRADLE OF A CIVILIZATION

What is the extent of the Indus River Basin?

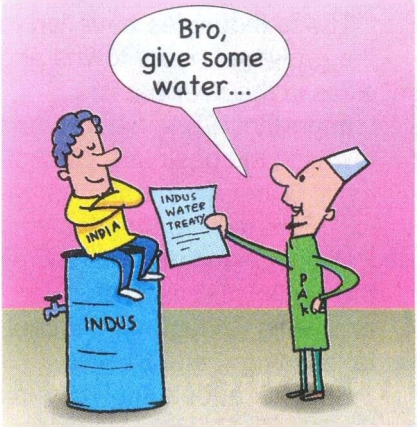
The Indus River Basin covers an area of around one million square kilometres and extends to four countries.

They are China, India, Afghanistan, and Pakistan. Snow and glacier melt water is the main source of water for this river system, as rainfall is low in this region.

The river ends in a delta, which includes numerous mangroves.

The Indus Basin stretches to the Karakoram and Haramosh Ranges in the north, the Arabian Sea in the South, the Sulaiman and Kirthar ranges in the west, and the Himalayas in the east.

In India, the basin spreads over the states of Jammu and Kashmir, Himachal Pradesh, Punjab, Rajasthan, Haryana, and the Union Territory of Chandigarh.



What is the Indus Water Treaty?

India and Pakistan are two of the four countries through which the Indus River flows.

The waters of the Indus and its tributaries support life in vast areas in these two countries.

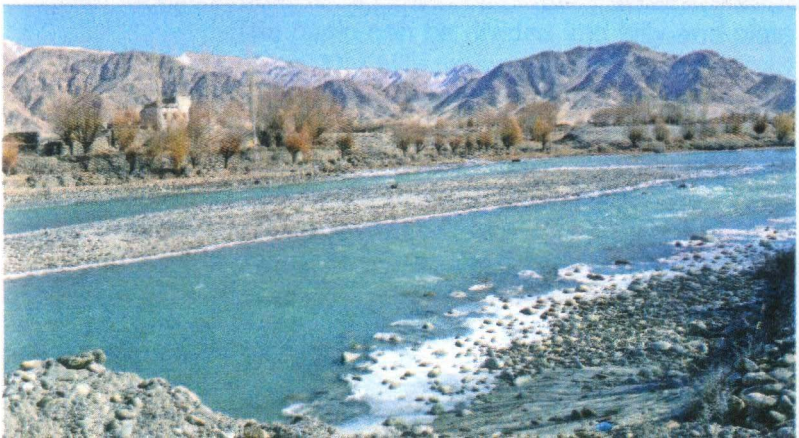
The Indus river system consists of three western tributaries of the Indus, and three eastern rivers.

The treaty was a result of Pakistani fears that since the sources of the rivers of the Indus basin were in India, India would have total control of the water.

So, the World Bank drew up a water-sharing treaty called the Indus Water Treaty. According to this treaty, Ravi, Beas, and Sutlej, which constitute the eastern rivers, are allocated for exclusive use by India, before they enter Pakistan.

Similarly, Pakistan has exclusive use of the western rivers Jhelum, Chenab, and Indus. The treaty was signed in Karachi on September 19th, 1960.

Indus River



Which are the major cities in the Indus Basin?

Most of the industries in the Indus River Basin are based on agriculture, and agriculture-based products.

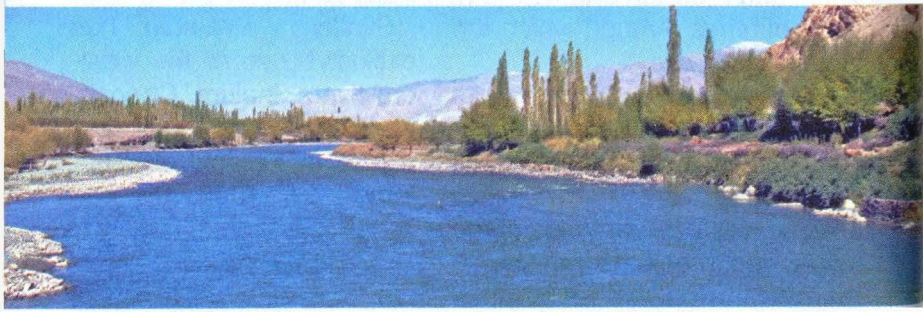
These include the textile, woollen, sugar, oil and paper industries, as well as industries manufacturing agricultural equipment.

Other industries in the region are cement, automobiles, machine and machine parts.

These industries have led to the growth of many towns and cities in the river basin.

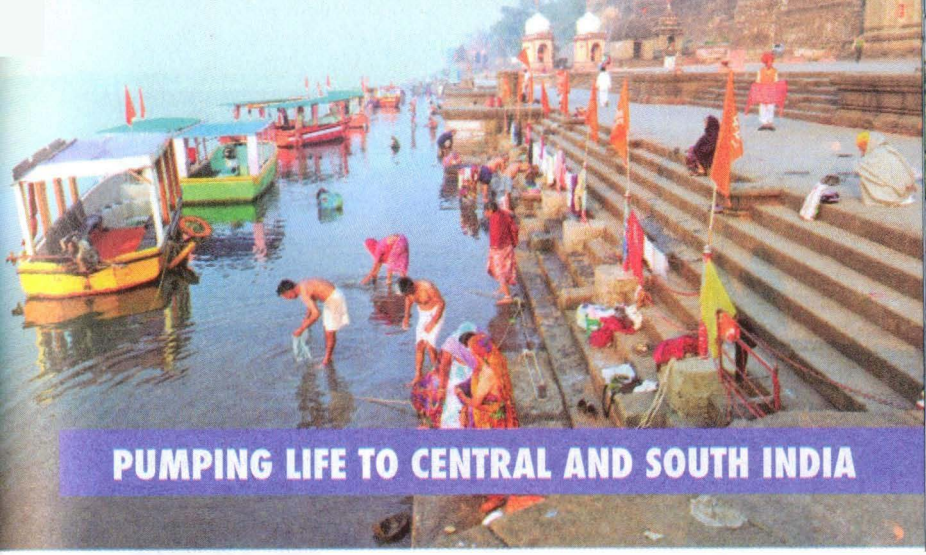
Important urban centres and towns in the basin are Chandigarh, Srinagar, Shimla, Ambala, Bikaner, Bathinda and Patiala. Chandigarh serves as the capital of Punjab and Haryana while Srinagar is the capital of Jammu and Kashmir.

Shimla, a beautiful city on the forested hillside of the Himalayas, is the capital of Himachal Pradesh.



Indus Dolphin

The Indus dolphin is a freshwater dolphin found in the Indus River. It is one of the world's rarest mammals, and the second most endangered freshwater river dolphin.



PUMPING LIFE TO CENTRAL AND SOUTH INDIA

What are the features of the Narmada River Basin?

The Narmada basin extends over the states of Madhya Pradesh, Gujarat, Maharashtra and Chhattisgarh.

Forty-one rivers flow through this basin which is bounded by the Vindhyas in the north, the Satpura ranges in the south, the Maikala range in the east and the Arabian Sea in the west.

The basin can be divided into hilly and plain regions. The hilly regions are in the upper part of the basin as well as in the lower middle reaches.

The major part of the basin is devoted to agriculture. The basin has several hydropower projects. These include the Indira Sagar, Sardar Sarovar, Omkareshwar, Bargi and Maheshwar projects.

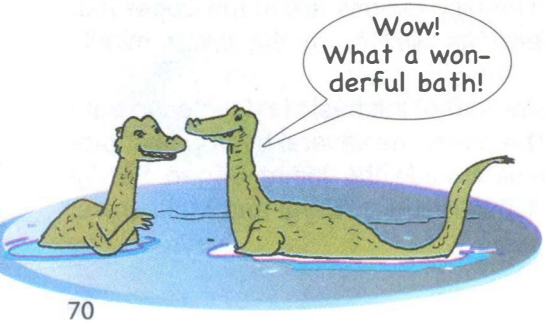
Narmada River

Why is the Narmada River Basin so important?

The Narmada River Basin is of great historical importance. Several dinosaur fossils have been found in the area including Titanosaurus Indicus found in 1877 by Richard Lydekker.

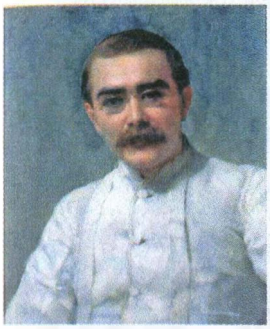
Recently, the fossil of a new genus of dinosaur was discovered in the basin. It is the Rajasaurus narmadensis, which means 'princely lizard from the Narmada Valley'.

Jabalpur is an important urban centre in the basin. Other important towns in the region are Khandwa and Baruch.



Fossil Park

The Mandla Plant Fossils Park is amazing in that it is composed of plants in fossil form. These plants flourished in the region between 40 million and 100 million years ago! This National Park is situated in Mandla district of Madhya Pradesh in India.



Rudyard Kipling

Which are the important National Parks in the Narmada basin?

The Narmada Basin, with its rich variety of plant and animal life, is the setting for many parks and sanctuaries.

It is home to around 76 species of mammals and about 276 species of birds. The Kanha National Park is located in the upper courses of Narmada.

The two tributaries of Narmada, Hallon and Banjar flow across this park. It is one of the best National Parks in Asia, and has been immortalized by Rudyard Kipling in his famous creation 'Jungle Book'.

The Satpura National Park is a unique ecosystem, and is very rich in biodiversity. The wildlife is spectacular, and includes the tiger, nilgai, sambar, chital, leopard, bhedki, four-horned antelope, chinkara, wild dog, bison and wild boar.

Narmada - Another View

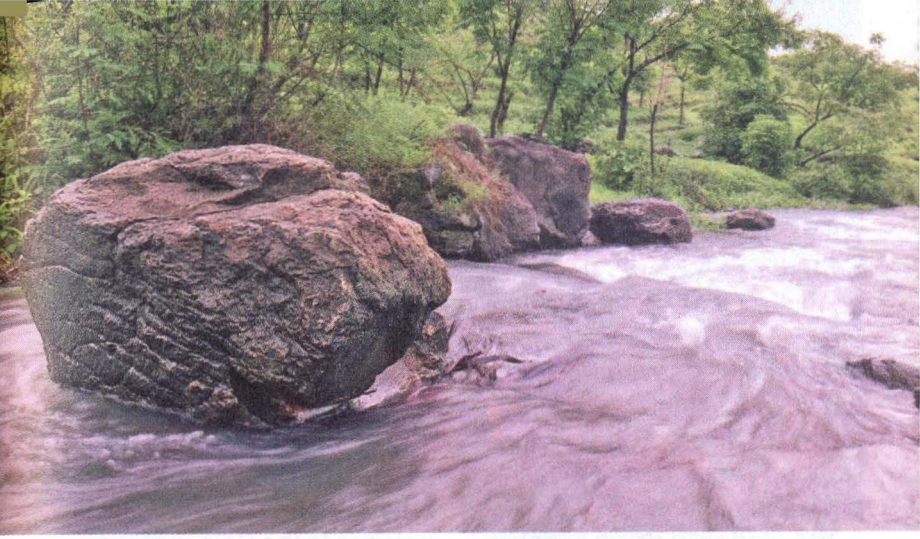
What are the main features of the Mahanadi River Basin?

The Mahanadi River Basin is bounded on the north by the hills of Central India, on the south and east by the Eastern Ghats, and on the west by the Maikala Range.

It extends over the states of Chhattisgarh and Odisha, as well as over small regions of Jharkhand, Maharashtra and Madhya Pradesh.

The basin is circular in shape and can be divided into four regions. They are the Northern Plateau, the Eastern Ghats, the Central Plain and the Coastal Plain.

The Chhattisgarh and coastal plains, which



receive ample rainfall, are rice growing area.

Important projects in the basin include the Hirakud dam, Mahanadi Delta Project, Hasdeo Bang, and Mahanadi Reservoir Project.

What is the extent of the Godavari River Basin?

The Godavari River Basin covers nearly 10 percent of the total geographical area of the country.

The Satmala Hills, the Ajantha range and the Mahadeo Hills form the northern boundary.

The basin stretches to the Eastern Ghats in the south and east, and the Western Ghats in the west.

It covers large areas in the states of Maharashtra, Andhra Pradesh, Chhattisgarh and Odisha as well as smaller parts of Madhya Pradesh, Karnataka and Union Territory of Puducherry.

The major hydro power stations in the basins are Upper Indravati, Upper Kolab, Balimela, Jayakwadi, Upper Sileru, Lower Sileru.

The number of dams constructed in Godavari basin is the highest among all the river basins in India.

What is the importance of the Godavari River Basin?

From the origin in Western Ghats, to its mouth at the eastern coast, Godavari traverses a major part of Peninsular India.

It nourishes several rich cultures and many important towns and cities. These include Nagpur, Aurangabad, Nashik and Rajhmundry.

The Godavari Basin is rich in different species of fish like carps, mahseer, and prawns.

The Wainganga is one of the most important tributaries of the Godavari. The Wainganga basin is home to three tiger reserves – the Tadoba and Pench National Park in Maharashtra and Indravati National Park in Chhattisgarh.

What are the features of the Krishna Basin?

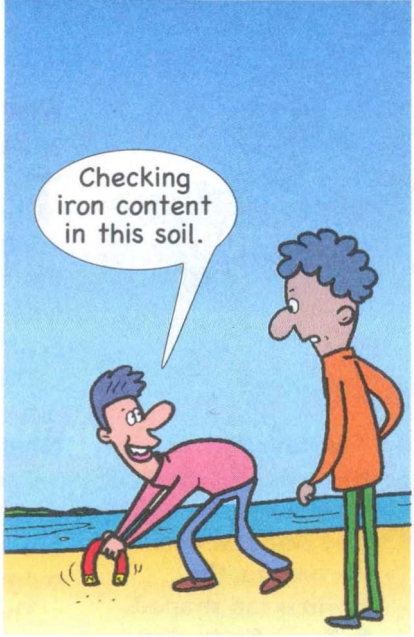
The Krishna River Basin stretches to the Balaghat ranges in the north, the Eastern Ghats in the south and east

and the Western Ghats in the west.

It is an interstate river, extending to three states. They are Andhra Pradesh, Maharashtra and Karnataka.

Iron and steel, cement, sugar cane, vegetable oil extraction and rice milling are important industrial activities at present in the basin.

Recently oil has been struck in this basin as well. The major urban Centres in the Basin are Pune and Hyderabad.



Two States, Two Shapes

The Kaveri River Basin has different shapes in Karnataka and Tamil Nadu. In Karnataka, the basin is fan shaped. In Tamil Nadu, the basin is shaped like a leaf.

● *Sneha Rao*

What is the extent of the Kaveri River Basin?

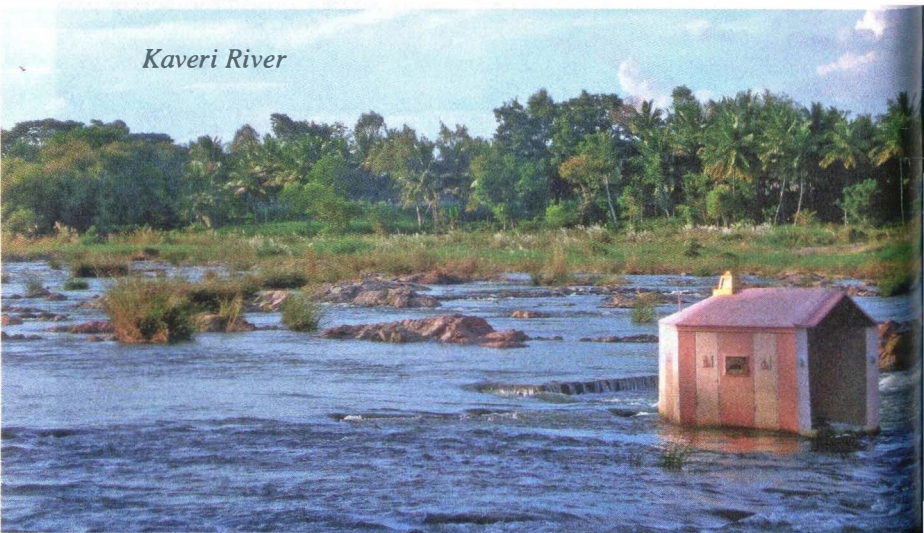
The Kaveri River Basin is bounded by Tungabhadra sub-basin of the Krishna basin on the Northern side, and the Palar basin on the Southern side.

The Western Ghats form the western boundary and the Eastern Ghats are the boundary on the east.

Tamil Nadu, Karnataka, Kerala and Union Territory of Puducherry are the states to which this basin extends.

The Kaveri basin extends over an area of 81,155 sq.km, which is nearly 24.7 per cent of the total geographical area of the country.

The city of Bangalore is situated just outside this basin.



Kaveri River

POLLUTION AND INDIAN RIVERS

Why is pollution a major problem in India's rivers?

Many of India's towns and cities are on the banks of rivers. These urban centres discharge their waste water directly into the nearest river, without treating it.

Since, most cities get their drinking water from the same river, this results in the spread of water-borne diseases.

In addition, Indian rivers and other sources of fresh water are polluted by industrial waste as well.

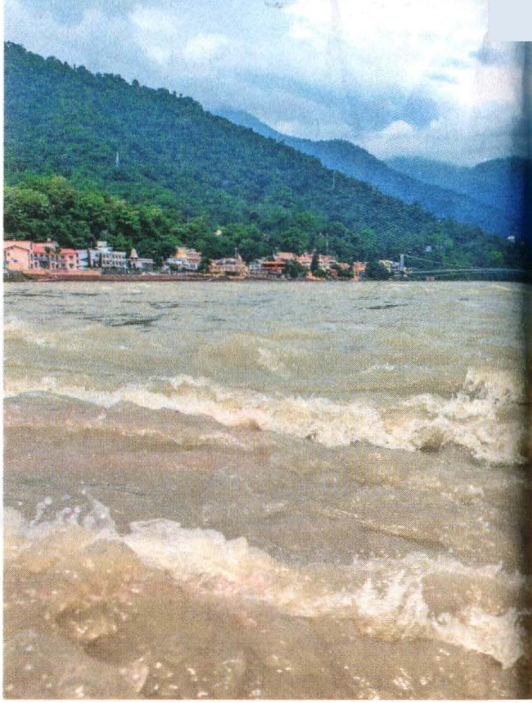
These industrial wastes can be very toxic to all forms of life. Fertilizers and pesticides also pollute our rivers as do religious and social practices.

As a consequence pollution is a major problem in most of India's rivers, causing harm not only to people, but also to aquatic and animal life

River Nila

The second longest river in Kerala is the River Nila. It is also known as the Bharathappuzha and is 209 km in length.

● *Dev Nath*



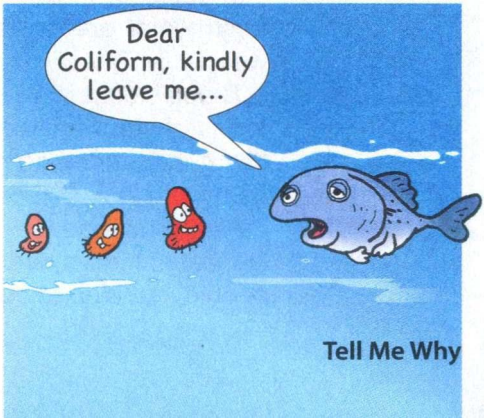
Which are the most polluted rivers in India?

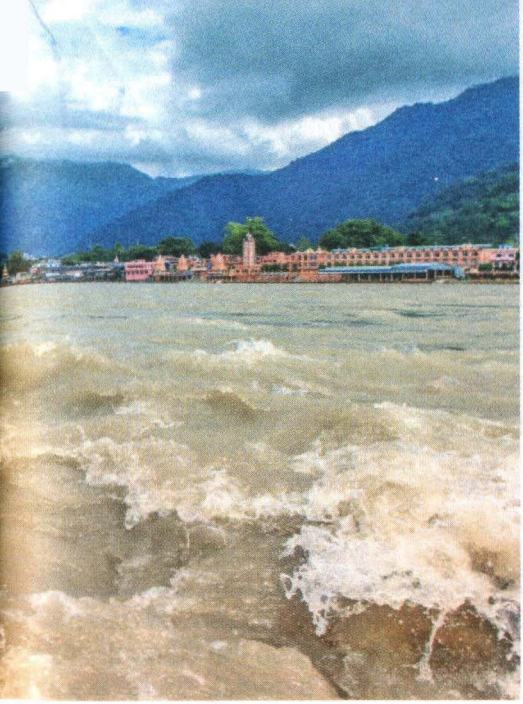
The major rivers of India are all polluted. These include even holy rivers like the Ganga and Yamuna.

Rivers like the Gomti, Ghaghara, Chambal, Mahi and Vardha also have high percentage of coliform bacteria.

Coliforms are a broad class of bacteria found in our environment, including the faeces of Man and other warm-blooded animals.

The presence of coliform bacteria in drinking water may indicate a





River Ganga at Rishikesh

possible presence of harmful, disease-causing organisms.

Pollution is not a problem limited to just big rivers. Even small rivers like the Oshiwara River in Mumbai are polluted by the solid, liquid, and chemical wastes generated by the city.

In fact, it is estimated that the number of contaminated rivers in the country has more than doubled over the past five years.

How badly is the Ganga polluted?

The River Ganga provides water to about 40 per cent of India's population across 11 states, serving an estimated population of 500 million or more.

In fact, the river directly or indirectly affects the lives of more people than any other river in the world.

Some of the world's oldest cities are situated on its banks, and it is considered sacred to the Hindus.

Yet sadly, approximately one billion litres of raw untreated sewage are dumped in the river on a daily basis. This amount has more than doubled in the last 20 years.

In fact, the amount of toxins, chemicals and dangerous bacteria found in the Ganga have now reached dangerous levels.

How does human waste contribute to the pollution of the Ganga?

The Ganga River Basin is one of the most densely populated areas in the world.

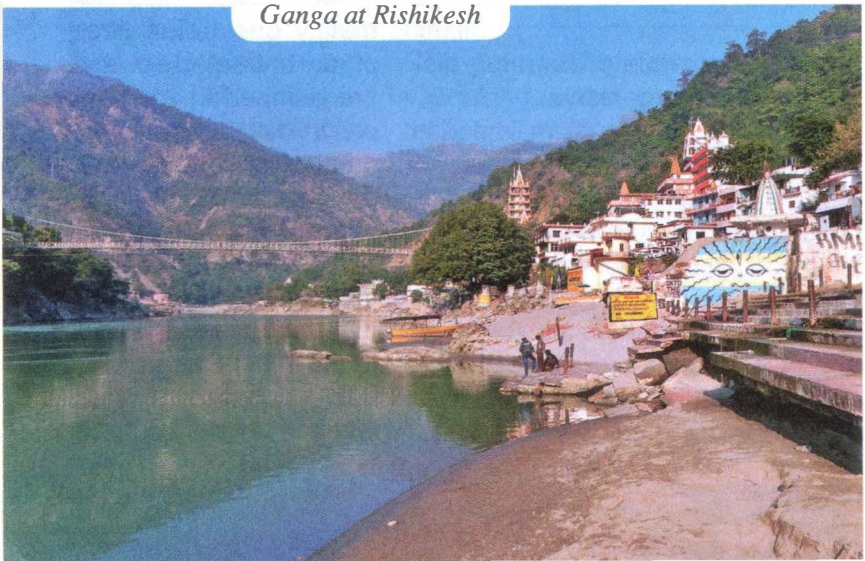
The river flows through 29 cities with a population over 100,000. It also flows through another 23 cities that have a population varying between 50,000 and 100,000, in addition to about 48 towns.

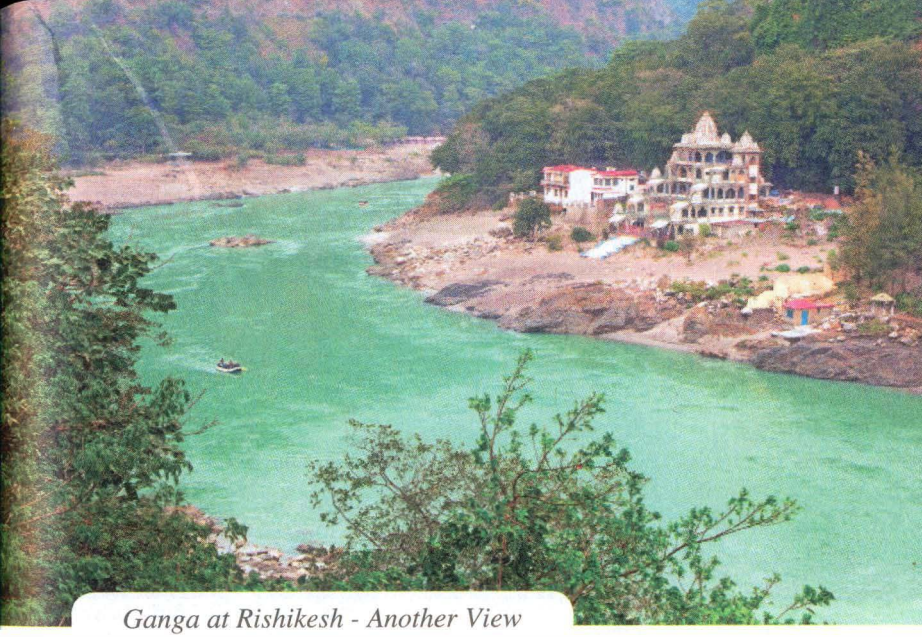
All these people depend on the Ganga for their drinking water. At the same time, vast numbers bathe and wash their clothes in the river.

The sewage of these cities can also be seen floating on the Ganga!

As a result, there are high levels of coliform in the water.

Ganga at Rishikesh





Ganga at Rishikesh - Another View

How do industrial wastes contribute to the pollution of the Ganga?

Industrial cities like Kanpur, Allahabad, Varanasi and Patna are located on the banks of the Ganga.

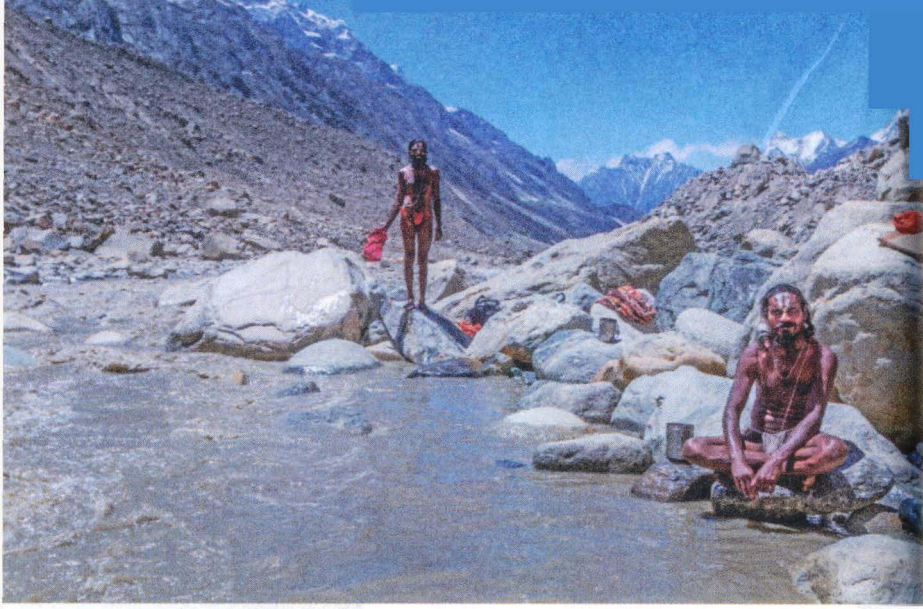
They are the home of numerous tanneries, chemical plants, textile mills and distilleries as well as other industrial and manufacturing units.

Each day, more than 500 million litres of wastewater from industrial sources are dumped directly into Ganga.

In many places, this wastewater entering the rivers is raw, and completely untreated. This industrial waste is making the Ganga dangerous for use as source of drinking or bathing.

The presence of dangerous chemicals and heavy metals far exceed any sort of safe or acceptable levels.

Without adequate and affordable treatment technologies, small-scale industries continue to pollute the River Ganga with over a billion litres of toxic chemicals.



Ganga at Uttarakhand

How has pollution affected aquatic life in the Ganga?

The basin of the River Ganga is India's richest basin in terms of fish species – a World Bank study published in 1996 had estimated it as around 350 species.

This diversity is at its richest at the myriad mouths of the Ganga, where it forms the world's largest mangrove forest, the Sunderbans.

However, because of the high levels of pollution, four freshwater fish species in the Ganga basin are threatened to various degrees.

The upper reaches of the Ganga is home to 12 freshwater turtle species, six of which are endangered.

Two species of crocodiles, the gharial and the mugger, the common Indian Otter and the smooth Indian Otter are also on the endangered list.

And then, of course, there is the famous Ganga dolphin, now declared India's national aquatic animal, which is under threat as well- and all this is because of pollution.

How has pollution of the Ganga increased water-borne diseases?

It was said in olden times that a single drop of Ganga water brushing your cheek could cleanse you of all sins.

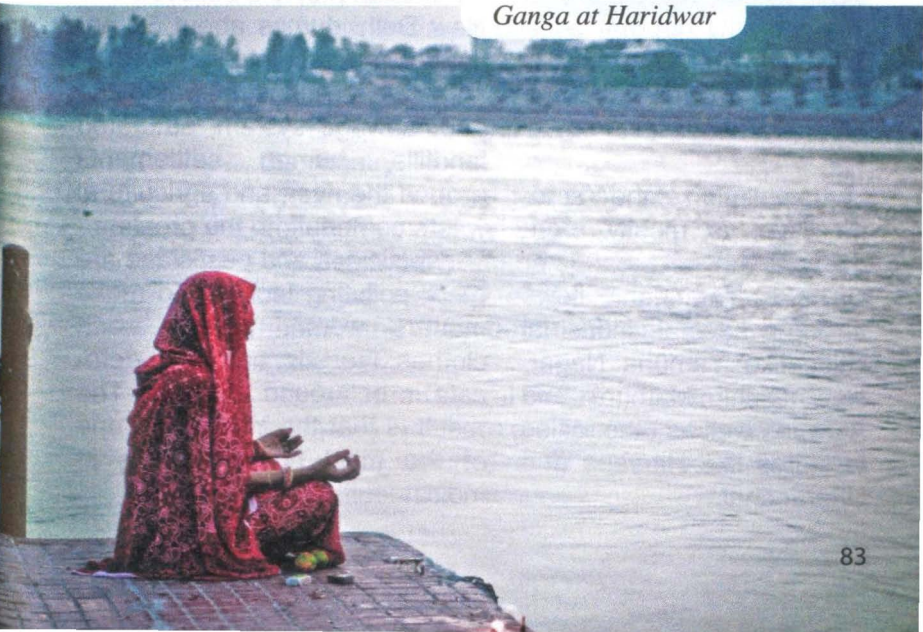
Now, because of the high levels of pollution, it may cause a rash. As pollution levels continue to soar, diseases that are caused and spread by contaminated water also spread rapidly.

Every year millions of Indians are affected by water-borne diseases like diarrhoea, viral hepatitis, dysentery, typhoid, cholera and gastroenteritis.

People are blinded by trachoma because they bathe in dirty water.

The Worldwatch Institute in Washington says that one person in the Ganga Basin dies every 60 seconds of diarrhoea and eight out of every 10 Indians suffer from amoebic dysentery each year.

Pollution has to be checked on a war footing, otherwise millions of Indians will suffer its fatal consequences.

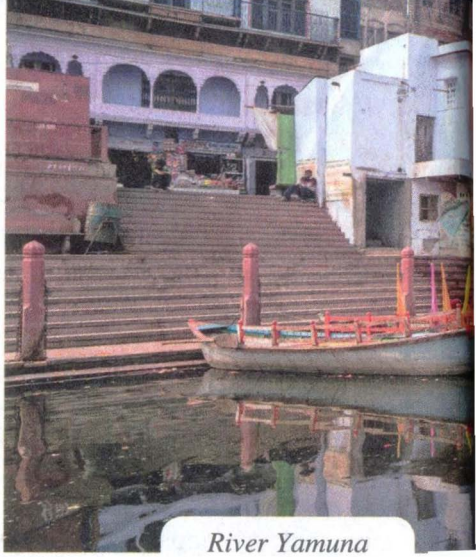


Ganga at Haridwar

The Pamba

The Pamba is also known as the 'Dakshina Bhagirathi'. It is the third longest river in Kerala. Pilgrims to Sabarimala take a ritual dip in its waters before proceeding to worship at the temple.

● *Radha Nair*



River Yamuna

What are the main causes for the pollution of the Yamuna River?

The pollution of the Yamuna River is mostly man-made.

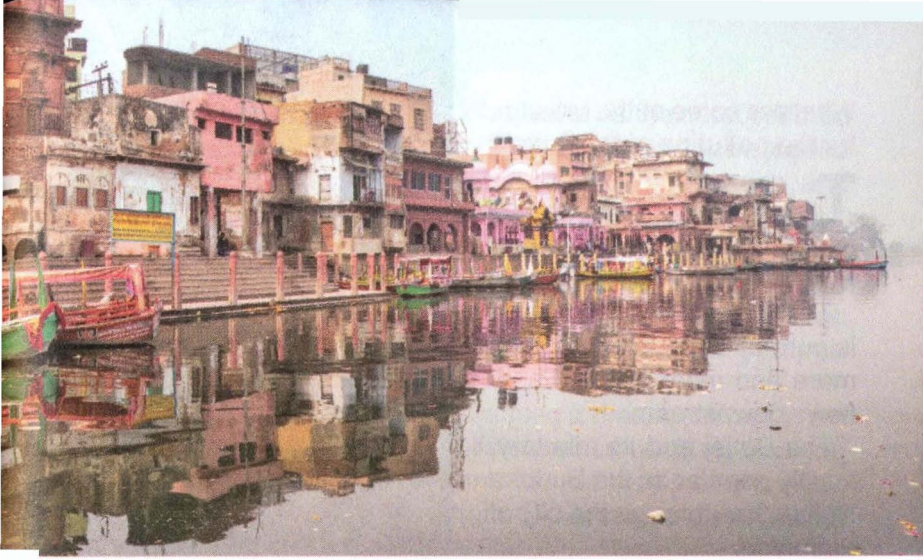
The Yamuna flows through several industrial cities like Yamuna Nagar, New Delhi, Mathura and Agra, as well as other cities in states like Haryana and Uttaranchal.

Sadly, this holy river has become a dumping ground for the waste of these cities.

For example, it is believed that New Delhi dumps about 58 per cent of its waste into this river.

In addition, industrial waste, the poor sewage system, saturated landfills, human settlements around the river, and agricultural waste contribute to the problem.

Insecticides and pesticides are other polluting factors. To make matters worse, people wash clothes, utensils, and even defecate in or around the river. The result is that the Yamuna is one of the most polluted rivers in India.



How does industrial waste increase the pollution of the Yamuna?

The Yamuna is one of the most important rivers of North India. It passes through Uttarakhand, Haryana, Delhi, and Uttar Pradesh.

At one time, it was the lifeline for the people of the area, but today it is the most polluted river of the country.

Industrial wastes find their way into the river from large industrial units.

In Delhi, the Yamuna appears like an industrial drain, as majority of the industries are on its banks, and they dump the untreated effluents into the river.

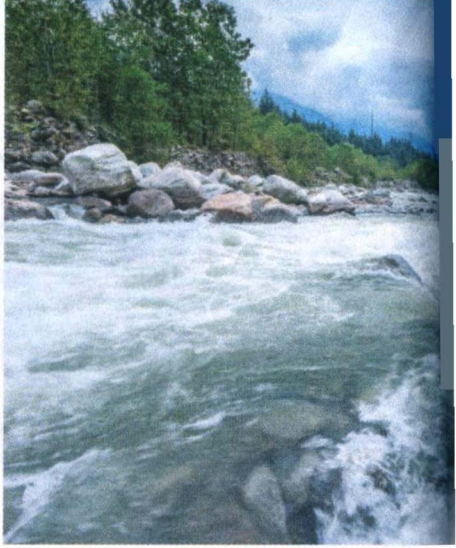
In fact, the Central Pollution Control Board has estimated that there are approximately 359 industrial units, which directly or indirectly discharge their effluents in Yamuna.

What are some of the reasons for the pollution of the Sutlej?

The Sutlej is one of the five rivers that are the pride of Punjab.

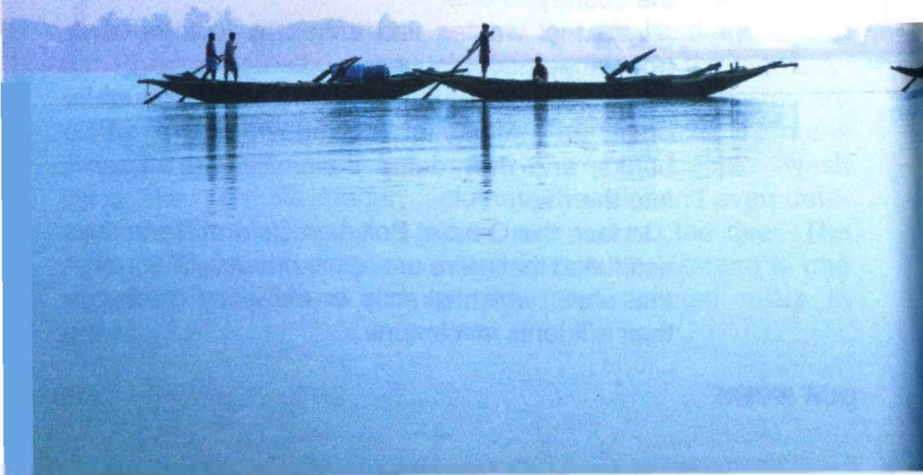
The water of this river which is pure at its source becomes more and more polluted as it flows downstream.

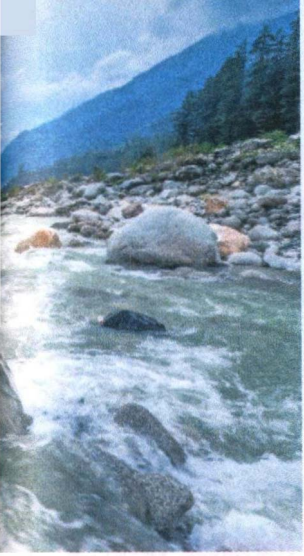
The Sutlej and its tributary, locally popular as the Buddha Nullah flow through the city of Ludhiana.



What has contributed to the pollution of the Kaveri?

The Kaveri River originates in the Brahmagiri hills of the Western Ghats. It flows through





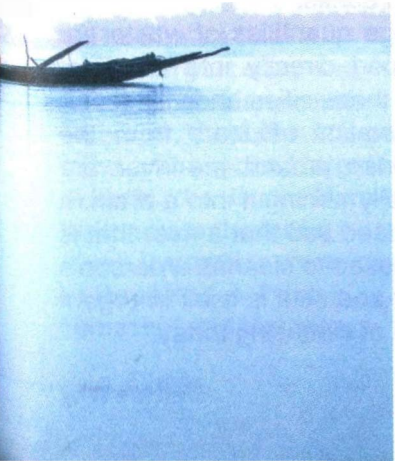
The Buddha Nullah is the most polluted water body of the city.It used to be a good source of fisheries several years ago, and 56 fish species had been recorded in it.

As Ludhiana developed, and the industries started coming up, the effluents being discharged by the Buddha Nullah into Sutlej River attained alarming proportions.

This has caused a drastic decline in the number of fish species besides, showing high concentration of heavy metal. All of this is extremely harmful to both human and animal life.

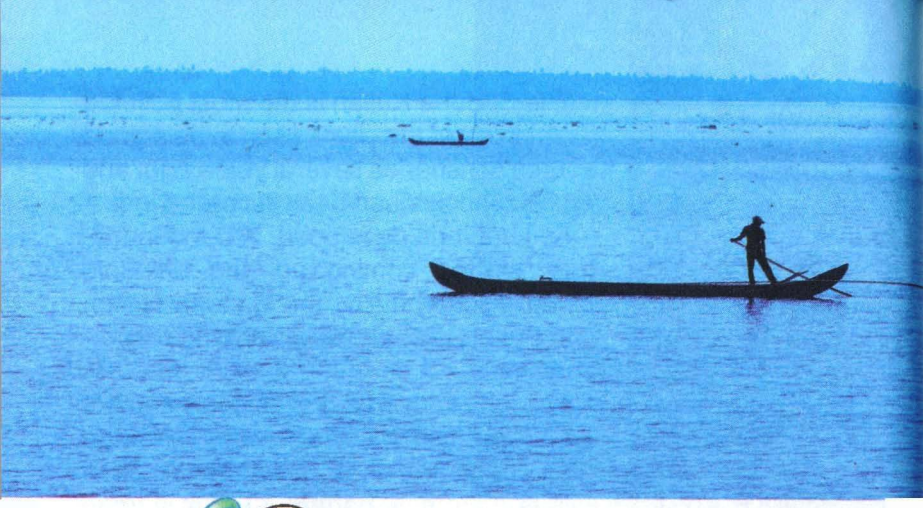
Karnataka and Tamil Nadu, and a small portion is in Kerala, too.

With three major reservoirs, a number of weirs and anicuts or dams built across the river, and its tributaries, the Kaveri is the most exploited river of the country- and one of the most polluted too.



The main polluters are the agricultural, industrial and urban sectors. Huge quantities of fertilizers and pesticides are discharged into the river.

The Kaveri is considered to be as sacred as the Ganga throughout its course, with the same power to wash off all one's sins, which makes it ironic that because of man's shortsightedness, it has become one of the dirtiest of rivers.



Rivers of Kerala

There are 44 rivers in Kerala, and most of them originate in the Sahyadri Hills of the Western Ghats. Forty-one flow west into the Arabian Sea, while only three flow eastwards. The Periyar, the Bharathapuzha and the Pamba are the three longest rivers in this lush green state.

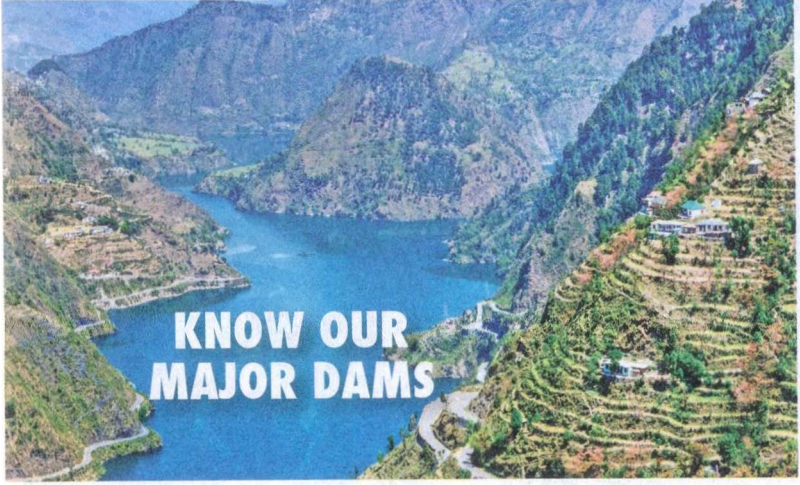
Why is the Narmada River so polluted?

The Narmada is the largest west-flowing river in India, and one of the most polluted as well.

Jabalpur, Hoshangabad, and Khargone in Madhya Pradesh, and Bharuch in Gujarat are some important cities located on its banks.

Huge quantities of waste are dumped directly into the river from these cities and villages.

Chemical effluents from the factories around the river are steadily turning it into a drain. It is indeed sad that a river that is supposed to cleanse a person's body and soul is itself in urgent need of cleansing today.



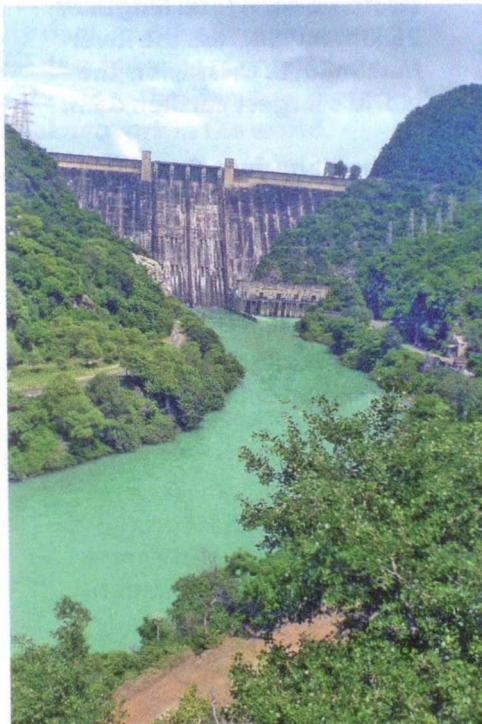
KNOW OUR MAJOR DAMS

■ **The Tehri Dam is the tallest dam in India, and the eighth tallest in the world. The water of its reservoir is used for irrigation and drinking. Located on the Bhagirathi River, the Tehri Dam soars to a height of 261 metres, and generates 1000 MW of electricity.**

■ **The Bhakra Dam is India's largest dam, and Asia's second largest. Its reservoir, the Govind Sagar Lake, is the second largest in India. The Bhakra Dam is built across the Sutlej River. It supplies electricity to three states- Punjab, Himachal and Haryana.**

Tehri Dam

Bhakra Dam



Idukki Dam

- **The Hirakud Dam is India's longest dam and one of the longest in the world. It stretches for a total length of 26 km. Built across the River Mahanadi in Orissa, it is the world's largest earthen dam.**

- **The Nagarjuna Sagar Dam is the world's largest masonry dam. Built across the Krishna River, it has one of the largest networks of canal systems in the world. The Nagarjunasagar Dam can store up to 11, 472 million cubic metres in its reservoir.**

- **The Idukki Dam is the only arch dam in India. Located in the Periyar Valley in Kerala, it is built between two mountains named Kuravanmala and Kurathimala. The dam plays an important role in the irrigation sector, and produces 780MW of power. Idukki Dam is the largest arch dam in Asia.**

- **The Indira Sagar Dam in Madhya Pradesh is built across the Narmada River in Madhya Pradesh. It has the biggest reservoir in India. The dam is part of a multipurpose project that provides both irrigation and power to large areas of the state.**

- **The Bhavanisagar Dam is one of the largest earthen**

dams in India. It is located on the Bhavani River in Erode District, Tamil Nadu. The dam is the second largest dam in Tamil Nadu, and one of the earliest river valley projects undertaken after India won her independence.

Sardar Sarovar Dam

- The Maithon Dam has an underground power station- the first of its kind in Asia. It was specially designed for flood control, and generates 60,000 KW of electric power. The dam is on the River Barakar in Jharkhand. The lake created by the dam is spread over an area of 65 sqkm.

- The Sardar Sarovar Dam is built on the Narmada near Rajpipla in the state of Gujarat. It is a long concrete gravity dam, and the world's second largest dam in terms of volume of concrete used. This dam has the longest canal network in the world.

Bhavanisagar Dam

Koyna Dam

■ **The Koyna Dam is constructed across the Koyna River in Maharashtra. It is one of the largest dams in the state and is one of the largest civil engineering projects commissioned after independence. The main purpose for commissioning the dam was to generate hydroelectric power and provide irrigation for the surrounding regions.**

■ **The Krishna Raja Sagar Dam is built on the River Kaveri. It is named after the former ruler of the Mysore Kingdom, Krishnaraja Wodeyar. This dam is the main source of water for irrigation in Mysore and Mandya. The dam's reservoir provides most of the drinking water for Mysore city, and for almost the whole of Bangalore city.**

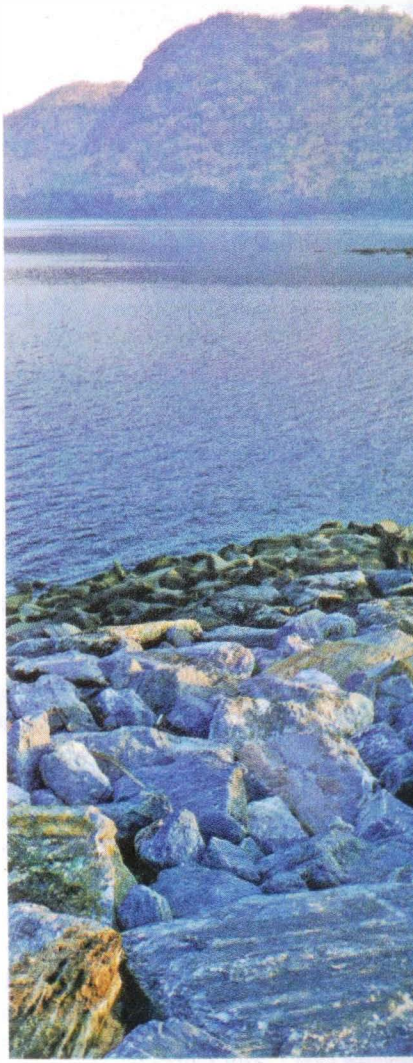
Krishna Raja Sagar Dam

- **The Mettur Dam is one of the largest and oldest dams in the country. It is constructed in a gorge, where the Kaveri River enters the plains. The dam, the park, the major hydro electric power stations, and hills on all sides, make Mettur a major tourist attraction.**

- **The Srisailam Dam is constructed across the Krishna River in a deep gorge. The dam is 512m long and has a reservoir of 800 sq.km. The construction of the dam started in 1960. It took over 20 years to complete.**

- **The Tungabhadra Dam is built across the Tungabhadra River in Karnataka. It is a multipurpose dam built to provide irrigation, electricity, and flood control. The dam creates the biggest reservoir on the Tungabhadra River, which is a tributary of the Krishna River.**

- **The Rihand Dam is built across the Pipri River in Uttar Pradesh. Its reservoir area is on the border of Madhya Pradesh and Uttar Pradesh. This reservoir is known as Govind Ballabh Pant Sagar.**



Tungabhadra Dam

RIVER FACTS

One River, Many Names

Narmada is a Sanskrit word meaning 'giver of pleasure'. The British called the river Nerbudda and Narbada. The Narmada is also known as the Rewa.

Yamuna Action Plan

The Yamuna Action Plan is one of the biggest river restoration projects in India. It is being undertaken jointly by the Governments of India and Japan. Cleaning up the Yamuna, and making it pollution free, is one of its top priorities.

Jim Corbett

Jim Corbett National Park

The famous Jim Corbett National Park is nurtured by two rivers- the Ramganga and the Kosi. The Ramganga flows through the park, and is famous for its mahseer or fighting fish. The endangered fish eating ghariyal can also be seen here. The Kosi flows near the park, and not through it.

Burlung-Buthur

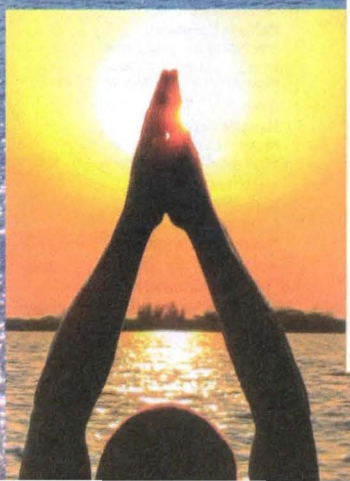
The Brahmaputra River is also called as 'Burlung-Buthur' by the Bodo people of Assam. The word 'Brahmaputra' means 'son of Brahma'.

Seven Rivers

The River Kosi is also known 'Sapta Kosi' meaning 'Seven Rivers'. This is because it has seven tributaries - Tamar Koshi, Sun Kosi, Indravati, Dudh Kosi, Arna Kosi, Likhu and Tamur. The three major tributaries meet at Triveni, from where the river is known as 'Sapta Kosi'.

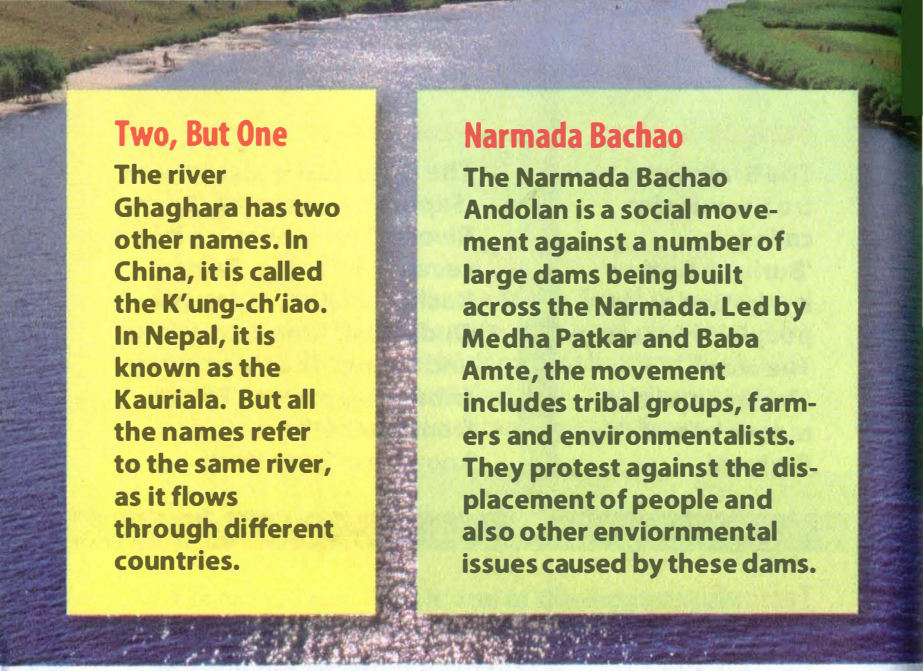
Terror River

The Chambal is a tributary of the Yamuna River. It flows through deep ravines that used to be the hideouts of dacoits. One of the most famous dacoits was Phoolan Devi, who later became a Member of Parliament.



Namami Gange

The Ganga Action Plan is a project to improve the quality of water in India's sacred river, the Ganga. Our Prime Minister Narendra Modi has given top priority to this sacred mission. An amount of Rs 20,000 crore is expected to be spent.



Two, But One

The river Ghaghara has two other names. In China, it is called the K'ung-ch'iao. In Nepal, it is known as the Kauriala. But all the names refer to the same river, as it flows through different countries.

Narmada Bachao

The Narmada Bachao Andolan is a social movement against a number of large dams being built across the Narmada. Led by Medha Patkar and Baba Amte, the movement includes tribal groups, farmers and environmentalists. They protest against the displacement of people and also other enviornmental issues caused by these dams.

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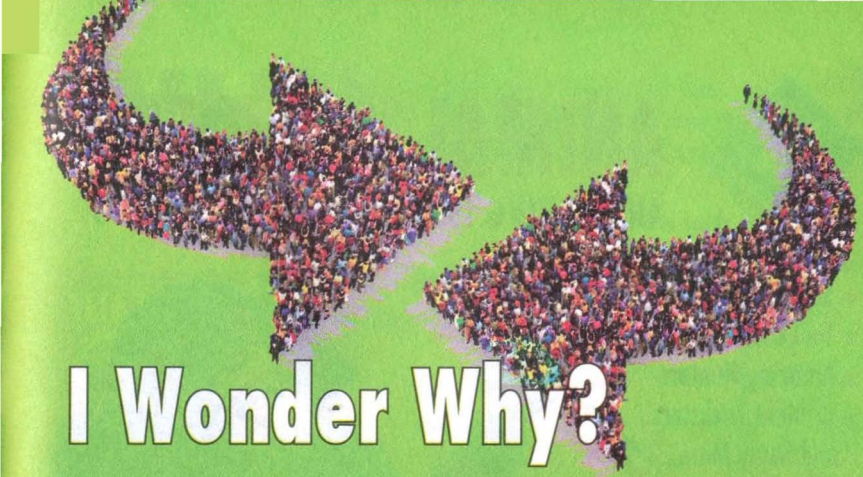


I Wonder Why?

Question of the Month

Why are some cricketers like Shikhar Dhawan left-handed?

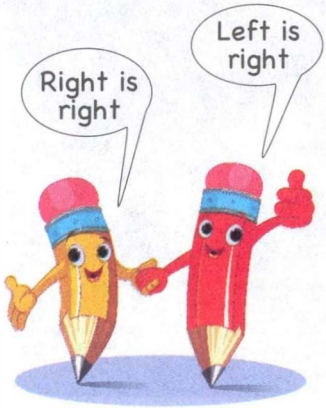
Our brain has two halves- one right and the other left. Generally, the left half of the brain is predominant over the right half. And the brain's left half controls the right half of our body.

Hence, the right half of the body is usually more skilled to do various activities. And this makes most of us right- handed.

But, in some persons the right half of the brain is predominant, and they work best with the left side of the body. That's why some people are left- handed.

So, you could say Shikhar Dhawan is left-handed because he is right- brained!

● *Indhu Thomas*



Question sent by:
Vivek Agarwal, on email

Send us your questions
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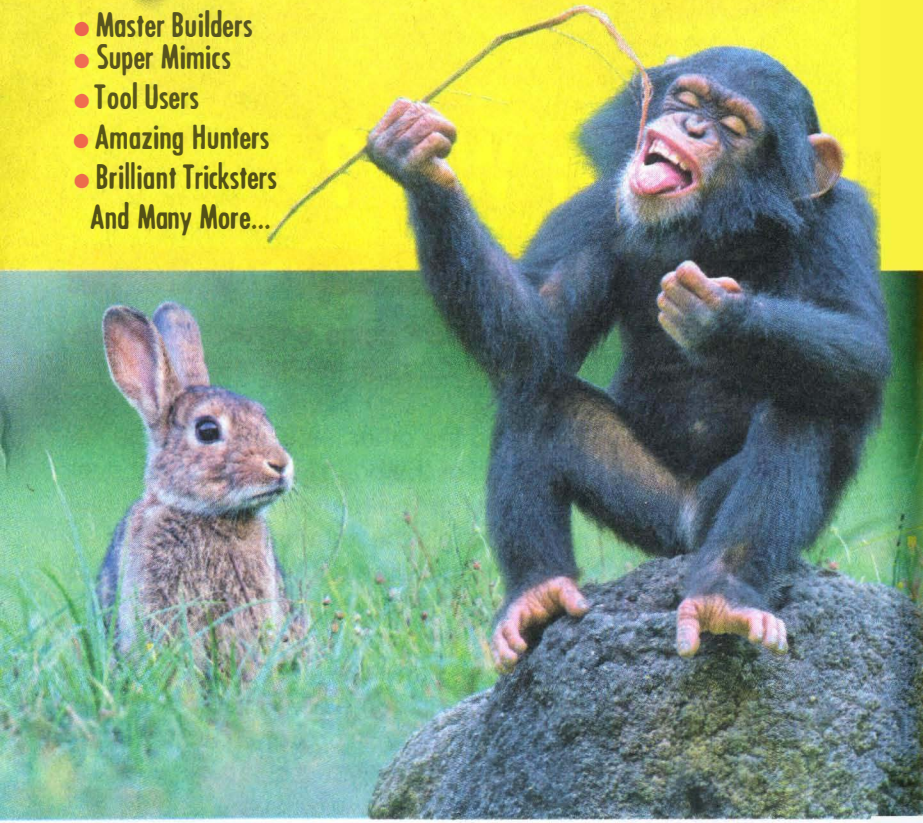
ANIMAL WONDERS

AN AMAZING ISSUE ON ANIMAL SECRETS

- Master Builders
- Super Mimics
- Tool Users
- Amazing Hunters
- Brilliant Tricksters

And Many More...



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